Gianni Arioli - Curriculum Vitae and publications

Personal information

Gianni Arioli
Place and date of birth: Milano, March 29, 1966
Nationality: Italian
Address: Dipartimento di Matematica, Politecnico di Milano,
piazza Leonardo da Vinci 32, 20133 Milano
Tel. office: 0223994510
E-Mail: gianni.arioli@polimi.it

Present appointment

- Title of appointment: Full Professor in Mathematical Analysis
- Start of appointment: February 2015
- Employer: Politecnico di Milano

Education

- Degree (Laurea) in Physics, Università di Milano, 1990
- PhD in Mathematics, Università di Milano, 1996

Teaching experience

- 2002-today: courses in Mathematical Analysis, Game theory, Numerical Analysis, Linear Algebra, Differential Equations, Optimisation, Mathematical Methods for Engineering (mathematical analysis, numerical analysis and statistics), Computer laboratory at the Politecnico di Milano
- 2012/13, 2014/15, 2015/16, 2016/17, 2017/18, 2018/19 courses in Mathematics and Statistics at the Free University of Bozen-Bolzano
- 1997-2002: courses in Mathematical Analysis and Mathematical Physics at the Università del Piemonte Orientale
- 1999: one course in Linear Algebra and one course in Differential Equations at the Georgia Institute of Technology, Atlanta, USA
- Supervisor of a PhD thesis in Computational Fluido-Dynamics (Monica Gamba, 2010)
- Supervisor of a PhD thesis in Finance (Giovanni Paolinelli, 2018)
- Supervisor of two post-docs (Matteo Pischiutta and Marco Ferrari) on computational fluidodynamics projects

Previous professional experience

- January-May 1992 PhD student in Physics at Rutgers University (USA)
- February 1995 - March 1996 quantitative financial analyst at Banca Fideuram, Milano
- March-November 1996 Post-doc in Mathematics at the University of Stockholm (Sweden)
- November 1996-June 1997 Post-doc in Mathematics at the University of Milano
- July 1997 - October 2002 Assistant Professor (Ricercatore) in Mathematical Analysis, Università del Piemonte Orientale
- March 1999 - June 1999: Visiting Assistant Professor at the Center for Dynamical Systems and Numerical Studies, Georgia Institute of Technology (USA)
- November 2002 - December 2004: Assistant Professor (Ricercatore) in Mathematical Analysis at the Politecnico di Milano.
- January 2005 - January 2015: Associate Professor in Mathematical Analysis at the Politecnico di Milano.
- 2008-2010 Collaboration with Altran spa to create a model and write a software to compute the thermodynamics of multiphase hydrocarbons flowing in pipelines
- 2011-2014 and 2016-2018 Collaboration with ENI spa to build computer simulations of multiphase flows in pipelines, using the softwares Matlab and OpenFoam, python

Language competence

Italian (mother tongue)
English (C2)
German (B2)
French (B1)

Publications:

1. G. Arioli, H. Koch: Some Reversing Orbits for a Rattleback Model, Journal of Nonlinear Science, 2022, 32(3), 38
2. G. Arioli: Computer assisted proof of branches of stationary and periodic solutions, and Hopf bifurcations, for dissipative PDEs, Communications in Nonlinear Science and Numerical Simulation, 2022, 105, 106079,
3. G. Arioli, G. Valente: What is really quantum in quantum econophysics?, Philosophy of Science, 2021, 88(4), pp. 665–685
4. G. Arioli, H. Koch: A Hopf Bifurcation in the Planar Navier–Stokes Equations, Journal of Mathematical Fluid Mechanics, 2021, 23(3), 70
5. G. Arioli, F. Gazzola, H. Koch: Uniqueness and Bifurcation Branches for Planar Steady Navier–Stokes Equations Under Navier Boundary Conditions, Journal of Mathematical Fluid Mechanics, 2021, 23(3), 49
6. G. Arioli, H. Koch: Traveling wave solutions for the FPU chain: A constructive approach, Nonlinearity, 2020, 33(4), pp. 1705–1722
7. G. Arioli: Mathematics education with conjectures and refutations, ICSIT 2020 - 11th International Conference on Society and Information Technologies, Proceedings, 2020, pp. 40–43
8. G. Arioli, H. Koch: Some Breathers and Multi-breathers for FPU-Type Chains, Commun. Math. Phys. (2019). https://doi.org/10.1007/s00220-019-03417-4
9. G. Arioli, H. Koch: Non-radial solutions for some semilinear elliptic equations on the disk, Nonlinear Analysis 179 294-308 (2019)
10. G. Paolinelli, G. Arioli: A model for stocks dynamics based on a non-Gaussian path integral, Physica A: Statistical Mechanics and its Applications, 517 499-514 (2019)
11. G. Paolinelli, G. Arioli: A path integral based model for stocks and order dynamics, Physica A: Statistical Mechanics and its Applications, 510, 387-399 (2018)
12. G. Arioli, H. Koch: Spectral stability for the wave equation with periodic forcing, J. Differential Equations 265, 2470–2501 (2018), DOI:/10.1016/j.jde.2018.04.040
13. G. Arioli, F. Gazzola, Torsional instability in suspension bridges: the Tacoma Narrows Bridge case, Commun Nonlinear Sci Numer Simulat 42 (2017) 342–357, DOI:10.1016/j.cnsns.2016.05.028
14. G. Arioli, H. Koch, Families of Periodic Solutions for Some Hamiltonian PDEs, SIAM J. Applied Dynamical Systems, (2017) Vol. 16, No. 1, pp. 1–15, DOI:10.1137/16M1070177
15. Pischiutta M., Arioli G., Di Lullo A. (2016) A Reduced Nonlinear Model for the Simulation of Two Phase Flow in a Horizontal Pipe. In: Russo G., Capasso V., Nicosia G., Romano V. (eds) Progress in Industrial Mathematics at ECMI 2014. ECMI 2014. Mathematics in Industry, vol 22. Springer, Cham, https://doi.org/10.1007/978-3-319-23413-7_67
16. G. Arioli, Teaching mathematics with automatic symbolic computation, Journal of applied mathematics and engineering, Vol 8, (2016), 9-23, ISSN 1337-6365
17. G. Arioli, F. Gazzola, On a Nonlinear Nonlocal Hyperbolic System Modeling Suspension Bridges, Milan J. Math. Vol. 83 (2015) 211–236 DOI: 10.1007/s00032-015-0239-9
18. G. Arioli, H. Koch, Some symmetric boundary value problems and non-symmetric solutions, J. Differential Equations 259 (2015) 796–816, DOI: 10.1016/j.jde.2015.02.018
19. G. Arioli, Insegnare Matematica con Mathematica, L'insegnamento della Matematica e delle Scienze Integrate, vol. 38 (2015), ISSN 1123-7570
20. G. Arioli, F. Gazzola, A new mathematical explanation of the Tacoma Narrows Bridge collapse, Applied Mathematical Modelling 39 (2015) 901–912, DOI: 10.1016/j.apm.2014.06.022
21. G. Arioli, H. Koch, Existence and stability of traveling pulse solutions of the FitzHugh-Nagumo equation, Nonlinear analysis 113 (2015) 51-70, DOI:10.1016/j.na.2014.09.023
22. D. Ambrosi, G. Arioli, H. Koch, A Homoclinic Solution for Excitation Waves on a Contractile Substratum, SIAM JOURNAL ON APPLIED DYNAMICAL SYSTEMS, 11,4, 1533-1542, DOI: 10.1137/12087654X
23. G. Arioli, H. Koch, Non-symmetric low-index solutions for a symmetric boundary value problem, JOURNAL OF DIFFERENTIAL EQUATIONS, 252, 1, 448-458, DOI: 10.1016/j.jde.2011.08.014

24. D. Ambrosi, G. Arioli, F. Nobile, A. Quarteroni, Electromechanical coupling in cardiac dynamics: the active strain approach, SIAM JOURNAL ON APPLIED MATHEMATICS, 71, 2, 605-621, (2012) DOI: 10.1137/100788379
25. G. Arioli, H. Koch, Computer-Assisted Methods for the Study of Stationary Solutions in Dissipative Systems, Applied to the Kuramoto-Sivashinski Equation, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS, 197, 3, 1033-1051, DOI: 10.1007/s00205-010-0309-7
26. G. Arioli, H. Koch, The Critical Renormalization Fixed Point for Commuting Pairs of Area-Preserving Maps, COMMUNICATIONS IN MATHEMATICAL PHYSICS, 295, 2, 415-429, DOI: 10.1007/s00220-009-0922-1
27. G. Arioli, H. Koch, Integration of Dissipative Partial Differential Equations: A Case Study, SIAM JOURNAL ON APPLIED DYNAMICAL SYSTEMS, 9, 3, 1119-1133, (2010) DOI: 10.1137/10078298X
28. G. Arioli, A, Szulkin, W.M. Zou, Multibump solutions and critical groups, TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY, 361,6, 3159-3187, Article Number: PII S0002-9947(09)04669-8
29. G. Arioli, Long term dynamics of a reaction-diffusion system, JOURNAL OF DIFFERENTIAL EQUATIONS, 235, 1, 298-307
30. G. Arioli, V. Barutello, S. Terracini, A new branch of mountain pass solutions for the choreographical 3-body problem, COMMUNICATIONS IN MATHEMATICAL PHYSICS, 268, 2, 439-463, (2006) DOI: 10.1007/s00220-006-0111-4
31. G. Arioli, F. Gazzola, H.-Ch. Grunau, Entire solutions for a semilinear fourth order elliptic problem with exponential nonlinearity, JOURNAL OF DIFFERENTIAL EQUATIONS, 230, 2, 743-770, DOI: 10.1016/j.jde.2006.05.015
32. G. Arioli, H. Koch, S. Terracini, Two novel methods and multi-mode periodic solutions for the Fermi-Pasta-Ulam model, COMMUNICATIONS IN MATHEMATICAL PHYSICS, 255, 1, 1-19, (2004) DOI: 10.1007/s00220-004-1251-z
33. G. Arioli, F. Gazzola, H.-Ch. Grunau, E. Mitidieri, A semilinear fourth order elliptic problem with exponential nonlinearity, SIAM JOURNAL ON MATHEMATICAL ANALYSIS, 36, 4, 1226-1258, DOI: 10.1137/S0036141002418534
34. G. Arioli, Branches of periodic orbits for the planar restricted 3-body problem, DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS, 11, 4, 745-755
35. G. Arioli, A, Szulkin, A semilinear Schrödinger equation in the presence of a magnetic field, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS, 170, 4, 277-295, DOI: 10.1007/s00205-003-0274-5
36. G. Arioli, P. Zgliczynski, The Hénon-Heiles Hamiltonian near the critical energy level - some rigorous results, NONLINEARITY, 16, 5, 1833-1852, DOI: 10.1088/0951-7715/16/5/316
37. G. Arioli, Periodic orbits, symbolic dynamics and topological entropy for the restricted 3-body problem, COMMUNICATIONS IN MATHEMATICAL PHYSICS, 231, 1, 1-24, (2002) DOI: 10.1007/s00220-002-0666-7
38. G. Arioli, P. Zgliczynski, Symbolic dynamics for the Hénon-Heiles Hamiltonian on the critical level, JOURNAL OF DIFFERENTIAL EQUATIONS, 171, 1, 173-202, DOI: 10.1006/jdeq.2000.3835
39. G. Arioli, F. Gazzola, S.Terracini, Minimization properties of Hill's orbits and applications to some N-body problems, ANNALES DE L'INSTITUT HENRI POINCARE-ANALYSE NON LINEAIRE, 17, 5, 617-650, DOI: 10.1016/S0294-1449(00)00122-0
40. G. Arioli, A, Szulkin, Homoclinic solutions of Hamiltonian systems with symmetry, JOURNAL OF DIFFERENTIAL EQUATIONS, 158, 2, 291-313, DOI: 10.1006/jdeq.1999.3639
41. G. Arioli, F. Gazzola, Periodic motion of an infinite lattice of particles with nearest neighbour interaction, NONLINEAR ANALYSIS, THEORY, METHODS & APPLICATIONS, 26, 6, 1103-1114
42. G. Arioli, F. Gazzola, Existence and numerical approximation of periodic motions of an infinite lattice of particles, ZEITSCHRIFT FUR ANGEWANDTE MATHEMATIK UND PHYSIK, 46, 6, 898-912, DOI: 10.1007/BF00917876
43. G. Arioli, F. Gazzola, H.-Ch. Grunau, E. Sassone, The second bifurcation branch for radial solutions of the Brezis-Nirenberg problem in dimension four, NONLINEAR DIFFERENTIAL EQUATIONS AND APPLICATIONS, 15, 1-2, 69-90, DOI: 10.1007/s00030-007-6034-8
44. G. Arioli, Optimization of the Forcing Term for the Solution of Two-Point Boundary Value Problems, Journal of Mathematics Volume 2013 (2013), Article ID 895876
45. G. Arioli, A deformation theorem in the noncompact nonsmooth setting and its applications. Electron. J. Differential Equations 2001, No. 16, 20 pp.

46. G. Arioli, A note on quasilinear elliptic eigenvalue problems. Electron. J. Differential Equations 1999, No. 47, 12 pp
47. G. Arioli, F. Gazzola, Some results on p-Laplace equations with a critical growth term. Differential Integral Equations 11 (1998), no. 2, 311–326
48. G. Arioli, F. Gazzola, On a quasilinear elliptic differential equation in unbounded domains. Rend. Istit. Mat. Univ. Trieste 30 (1998), no. 1-2, 113–128 (1999)
49. G. Arioli, A. Szulkin, Periodic motions of an infinite lattice of particles: the strongly indefinite case. Dedicated to the memory of Gilles Fournier (Sherbrooke, PQ, 1997). Ann. Sci. Math. Québec 22 (1998), no. 2, 97–119
50. G. Arioli, F. Gazzola, S.Terracini, Multibump periodic motions of an infinite lattice of particles, MATHEMATISCHE ZEITSCHRIFT, 223, 4, 627-642
51. G. Arioli, F. Gazzola, Quasilinear elliptic equations at critical growth. NoDEA Nonlinear Differential Equations Appl. 5 (1998), no. 1, 83–97
52. G. Arioli, F. Gazzola, Weak solutions of quasilinear elliptic PDE's at resonance. Ann. Fac. Sci. Toulouse Math. (6) 6 (1997), no. 4, 573–589
53. G. Arioli, J. Chabrowski, Periodic motions of a dynamical system consisting of an infinite lattice of particles. Dynam. Systems Appl. 6 (1997), no. 3, 387–395
54. G. Arioli, B. Ruf, Periodic solutions for a system of forced and nonlinearly coupled oscillators with applications to electrical circuits. Dynam. Systems Appl. 4 (1995), no. 1, 87–102
55. G. Arioli, L. Galgani, Numerical studies on classical electrodynamics, PHYSICS LETTERS A, 162, 4, 313-322, DOI: 10.1016/0375-9601(92)90023-F
56. G. Arioli, F. Gazzola, Existence and multiplicity results for quasilinear elliptic differential systems, COMMUNICATIONS IN PARTIAL DIFFERENTIAL EQUATIONS, 25, 1-2, 125-153, DOI: 10.1080/03605300008821510