

Curriculum vitae professor **Massimo Villarini**

Born 08/07/1958, Umbertide, Italy

Graduation: Università di Perugia, Mathematics-1984

PhD (Mathematics): Università di Firenze, 1989

Research Fellow: Università di Firenze, 1990-1998

Associate professor: Università di Modena, 1998-present

Author of more than 20 scientific papers indexed in Mathematical Review

Long term (more than one month) research visiting

1994 Laboratoire de topologie, Université de la Bourgogne, Dijon, France

1995 Laboratoire de topologie, Université de la Bourgogne, Dijon, France

1996 IMPA Rio de Janeiro, Brazil

1998 IMPA Rio de Janeiro, Brazil

1999 IRMAR Université de Rennes 1, France

2005 IMPA Rio de Janeiro, Brazil

Teaching

I taught courses in analysis and /or elementary geometry and linear algebra at undergraduate / graduate level at Università di Firenze and Università di Modena.

I taught courses on Dynamical Systems at PhD level (Università di Firenze)

Research

Dynamical systems: holomorphic dynamics and holomorphic foliations.

Local questions: linearization and normalization at stationary points, convergence of the normalizing map and related geometric bounds on the convergence domain. Obstruction to linearizability in dimension two (centers) and greater than two (multicenters) and related examples of foliations by circles of unbounded length on compact manifolds. Rigidity of some perturbations of foliations by circles of compact manifolds.

Global and non-local questions: bifurcation from infinity of limit cycles for two-dimensional systems. Existence of periodic orbits for dynamical systems *via* perturbative, topological and variational methods, in particular finite-dimensional approximations in the search of critical points of functionals.

Spectral theory: study of the asymptotic behavior of the eigenvalues of Laplace operator (this research is still ongoing, but it has not led to the production of any scientific paper, yet)

Approximation of solutions of hyperbolic and parabolic equations and lattice fields theory: hyperbolic and parabolic equations as limit of finite-dimensional dynamical systems when the phase space dimension goes to infinity i.e. reduction of some scalar field theory to Newton dynamics (first principles) (scientific papers related to this subject are still in pre-print form)

Research organization and tutoring

I participated, both as research member as well as responsible of a local (Modena) research unit, to several Italian National research projects (PRIN).

I have been the Italian responsible for two joint research programs, financed by the Italian Foreign Ministry, with research institution in Portugal (CMAF, Lisbon) and in Belgium (Université de Namur).

I organized several scientific seminars and some international workshops in Modena.

I have been in charge as scientific advisor for two post-doc grants by Università di Modena e Reggio Emilia

Partecipazione to workshops and meetings with an invited communication

1995 Delft, The Netherlands: Symposium on Planar Nonlinear Dynamical Systems: “Algebraic (un)solvability of the problem of existence of analytic first integrals”

1996 Lleida, Spain: Nonlinear Dynamical Systems: “Smooth linearization of centres”

1998 Diepenbeek, Belgium: Local Bifurcations of dynamical systems: “Dynamics of multicentres”

1998 IMPA Rio de Janeiro, Brazil: Complex analysis and dynamical systems: “Linearization of multicentres and holomorphic dynamics”

2006 Barcelona, Spain: Symposium on planar vector fields: “Holomorphic linearization of Poincaré singularities *via* variation of constants”

2007 Firenze, Italy: Topological methods in Differential Equations: “Multiplicity of periodic solutions of Hamiltonian systems”

2009 Ancona, Italy: Workshop on nonautonomous differential equations: “On the existence of periodic solutions of Hamiltonian systems”

2011 Ancona, Italy: Workshop on nonautonomous differential equations: “Approximations of Morse critical points of finite index”

2014 Trieste, Italy: Complex geometry, analysis and foliations: “Non-linearizability of multicentres”

2022 Firenze, Italy: Two days in qualitative dynamics: “Lagrange’s discrete model of wave equation in space dimension greater than one”

2023 Firenze, Italy: Conference on “Il contributo matematico alla nascita della Facoltà di Ingegneria”: comunicazione su invito su “Approccio discreto alla Teoria dei Campi: soluzione ad un problema posto da G. Gallavotti”

Last updated: 11/9/2024