CURRICULUM VITAE

First Name:	Roberto
Family Name:	Zivieri
Date of Birth:	14-08-1964
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KNOWN LANGUAGES

Italian: native

English: fluent

French: intermediate

ACADEMIC TITLES

1999: PhD in Physics, Department of Physics, University of Modena, Italy. Thesis: "*Anharmonic properties of a simple metal: a molecular dynamics study*". Supervisors: Prof. V. Bortolani and Prof. G. Santoro. Department of Physics, University of Modena and Reggio Emilia, Italy. Outcome: Positive. Grade: Excellent (100/100).

1994: Degree in Physics, Department of Physics, University of Modena, Italy. Thesis: "*Reticular dynamics of Cu: comparison between semiempirical calculations and classical molecular dynamics simulations*". Supervisor: Prof. G. Santoro, Department of Physics, University of Modena, Italy. Grade: 110/110 summa cum laude.

1989: Degree in Medicine and Surgery, Faculty of Medicine, University of Modena, Italy. Thesis: "*Metabolic effects of an aminoacidic diet without triptofan on cirrhotic patients*". Supervisor: Prof. E. Rocchi (Department of Internal Medicine, University Hospital, Modena). Grade: 110/110 summa cum laude.

PROFESSIONAL EXPERIENCE

18th June 2014 – 31st October 2015: Post-Doctoral University fellowship at the Department of Electrical and Information Engineering, University of Bari, Italy on the subject: "*Low voltage network diagnostics*" and "Spin dynamics under a spin-polarized current "

1st December 2013 - Present: Visiting at the Department of Physics and CNISM Unit of Ferrara, University of Ferrara, Italy on the subject: *Development and application for the calculation of spin-wave modes in multimaterial nanostructured magnetic systems*".

1st December 2012 – 30th November 2013: Post-Doctoral University fellowship at the Department of Physics and Earth Sciences and CNISM (Interuniversity National Consortium for Physical Sciences of Matter), Unit of Ferrara, University of Ferrara, Italy on the subject: "*Development and application for the calculation of spin-wave modes in multimaterial nanostructured magnetic systems*".

1st August 2011 – 30th November 2012: Post-Doctoral University fellowship within the European Project MAGNONICS (Mastering Magnons in Magnetic Metamaterials) of European Community VII Square Program (FP7/2007-2013). This was done under Grant Agreement n^{o} 228673 at the Department of Physics and CNISM (Interuniversity National Consortium for Physical Sciences of Matter), Unit of Ferrara, University of Ferrara, Italy on the subject: "*Development of theoretical models and numerical implementation for the calculation of spin-wave modes in one-, two- and three-dimensional magnetic systems*".

1st July 2011 – 31st July 2011: Visiting at the Department of Physics and CNISM Unit of Ferrara, University of Ferrara, Italy continuing the activity: "*Development of theoretical models and numerical implementation for the calculation of spin-wave modes in one-, two- and three-dimensional magnetic systems*".

2nd January 2010 – 30th June 2011: Contract of coordinated and continuative cooperation within the European Project MAGNONICS of European Community VII Square Program (FP7/2007-2013) . This was done under Grant Agreement n^{o} 228673 at the Department of Physics and CNISM Unit of Ferrara, University of Ferrara, Italy on the subject: "*Development of theoretical models and numerical implementation for the calculation of spin-wave modes in one-, two- and three-dimensional magnetic systems*".

1st January 2008 – 31st Dicember 2009: Fixed term CNISM Researcher, 3rd level, CNISM Unit of Ferrara, University of Ferrara, Italy on the subject: "*Theoretical study of spin dynamics in laterally confined magnetic systems*".

1st September 2006 – 31st Dicember 2007: Fixed term CNISM Researcher, 3rd level, CNISM Unit of Ferrara, University of Ferrara, Italy on the subject: "*Theoretical activity in the field of confined magnetic systems*".

2nd November 2005 – 31st August 2006: Visiting scientist at the Department of Physics, University of Modena and Reggio Emilia, Italy on the subject: "*Dynamical properties of laterally confined magnetic nanostructures*".

2nd May 2003 – 1st November 2005: Post-Doctoral University fellowship at the Department of Physics, University of Ferrara, Italy on the subject: "*Dynamical properties of laterally confined magnetic nanostructures"*.

16th January 2003 – 31st March 2003: Assignment of work performance at the Department of Physics, University of Ferrara, Italy on the subject: "*Software development for the interpretation of Kerr magnetometry spectra in submicrometric systems*".

15th January 2001 – 16th January 2003: Post-doctoral fellowship of the Istituto Nazionale di Fisica della Materia (INFM), National Institute of Physics of Matter, at the Department of Physics, University of Ferrara, Italy on the subject: "*Magnetism of multilayers and nanostructures, spin waves"*.

15th Dicember 2000 – 15th January 2001: Contract of occasional work at the Department of Physics, University of Ferrara, Italy on the subject "*Materiali magnetici nanostrutturati*".

1st December 1998 – 30th November 2000: Post-doctoral INFM (Istituto Nazionale di Fisica della Materia) fellowship at the Department of Physics, University of Ferrara, Italy on the subject: "*Spin waves and Brillouin scattering in magnetic films: theoretical and computational aspects"*.

TEACHING EXPERIENCE

March 2016 – June 2016: Instructed professor for didactics activities support for the course "General Physics, part I, Mechanics and Thermodynamics", Degree in Geophysics and Informatics, University of Ferrara, Italy.

March 2016 – June 2016: Instructed professor for didactics activities support for the course "Structure of Matter", Degree in Physics, University of Ferrara, Italy.

October 2015 - January 2016: Contract Professor for the Official Course "*Physics of Critical Phenomena*", Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

March 2015 – June 2015: Instructed professor for didactics activities support for the course "Structure of Matter", Degree in Physics, University of Ferrara, Italy.

February 2015 – April 2015: Instructed professor for the course "*Introduction to modern physics*", Active Intership, Class A049, University of Ferrara, Italy.

October 2014 - January 2015: Contract Professor for the official course "*Physics of Critical Phenomena "*, Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

May 2014 – June 2014: Instructed professor for the course "*Introduction to modern physics*", Special Paths Enablers, Class A049, University of Ferrara, Italy.

October 2013 - January 2014: Contract Professor for the official course "*Physics of Critical Phenomena "*, Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

October - November 2012: Course for PhD students in Physics, University of Ferrara, Italy on "*Topological Defects in Physics*".

October 2012 - January 2013: Contract Professor for the official course "*Physics of Critical Phenomena* ", Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

November 2011 - January 2012: Contract Professor for the official course "*Physics of Critical Phenomena* ", Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

October 2010 - January 2011: Contract Professor for the official course "*Physics of Critical Phenomena* ", Master Degree in Physics, University of Ferrara, Italy. Lectures given in English.

March 2010 - June 2010: Contract Professor for the official course "*Physics of Critical Phenomena* ", Master Degree in Physics, University of Ferrara, Italy.

December 2009 - January 2010: Course for PhD students in Physics, University of Ferrara, Italy on "*Vortices and Topological Defects in Condensed Matter Physics*".

April 2009 - June 2009: Contract Professor for the supplementary course "Models and theoretical approaches for the study of thermodinamic critical properties to the official course " *Physics of Critical Phenomena*", Master Degree in Physics, University of Ferrara, Italy.

April 2008 – October 2008: Tutor activity for the official course "*Study of functions of physical interest*". Degree in Physics and Astrophysics, University of Ferrara, Italy.

March 2008 - May 2008: Contract Professor for the supplementary course "*Molecular spectroscopy*" to the official course of "*Introduction to Atomic and Molecular Physics*", Degree in Physics and Astrophysics, University of Ferrara, Italy.

March 2007: Contract Professor for the supplementary course "*Molecular spectroscopy*" to the official course of "*Introduction to Atomic and Molecular Physics*", Degree in Physics and Astrophysics, University of Ferrara, Italy.

March 2005: Contract Professor for the supplementary course "*Molecular spectroscopy*" to the official course of "*Introduction to Atomic and Molecular Physics*", Degree in Physics, University of Ferrara, Italy.

April 2002 - May 2002: Contract Professor for the supplementary course "*Phase transitions and critical phenomena*" to the official course of "*Introduction to Atomic and Molecular Physics*", Degree in Physics, University of Ferrara, Italy.

EXPERIENCE ABROAD

February 2004 - April 2004: Scholar fellowship at the Department of Physics of the University of Western Australia (UWA) in Perth, Australia (Prof. Robert Stamps).

Research topic

Formulation of a variational theory for the calculation of the spectrum of spin modes in cylindrical dots with in-plane magnetization.

INFORMATIC EXPERIENCE

- Development of codes with Mathematica, Matlab, Fortran languages.
- Knowledge of the main operative systems on PC and on server: Windows, UNIX and Linux.
- Wide knowledge of finite-difference and finite-element methods for the determination of the static and the dynamic properties of magnetic films, multilayers and confined magnetic structures (dots, wires, antidots, 1D, 2D arrays, magnonic crystals): Object Oriented MicroMagnetic Framework code, NMag, Hamiltonian-based Dynamical Matrix code, Lagrangian-based Dynamical Matrix Code.

SCIENTIFIC ACTIVITY

The scientific activity 1998-2016 has mainly focused on topics of theoretical condensed matter physics with particular reference to: 1) Study of phonons dynamics and of phonons scattering cross-section in bulk and surface metals. 2) Study of spin-waves propagation and scattering cross-section in ferromagnetic multilayers and in confined magnetic systems either composed by single ferromagnetic elements or by periodic systems. 3) Theoretical investigations and analytical description of the physical properties of topological defects with special emphasis on magnetic vortices and magnetic skyrmions. 4) Theoretical analysis of metamaterial properties of magnetic nanostructures via an effective medium description 5) Development of mathematical and micromagnetic models able to describe the dynamical properties of magnetic systems and more generally systems studied in theoretical condensed matter physics. In the last two years also an activity related to electrical engineering and mathematical models applied to engineering problems has been performed.

2014-2016: During the research activity within the Res Novae Project at the Department of Electrical and Information Engineering, Politecnico of Bari, University of Bari, Italy (Supervisor: Prof. Silvano Vergura). Title of the project: ""*Low voltage network diagnostics*".

2010-2014: During the research activity FP7/2007-2013 within the European Projects MAGNONICS and DYNAMAG, and the CNISM Innesco Project at the Department of Physics, University of Ferrara, Italy (Supervisors: Prof. Fabrizio Nizzoli and Dr. Loris Giovannini).
Title of the European Project MAGNONICS: "*Mastering Magnons in Magnetic Meta-materials*".
Title of the European Project DYNAMAG:"*Advanced Computational Studies of Dynamic Phenomena in Magnetic Nano-materials* ".
Title of the Innesco Project CNISM: "*Realization of a new micro-focused Brillouin Light Scattering apparatus for the study of spin waves excited by spin-transfer torque in nanomagnets*".

- Study of the main features of an electrical signal in low voltage active and reactive power distribution lines by means of the Hilbert-Huang transform. Calculation of the intrinsic modes according to the empirical decomposition method for a period of 9 months and for a seasonal analysis. Introduction of quantitative indexes to study the degree of coherence and of periodicity of the signal. Comparison with active and reactive power measured and reconstructed data.

- Study of the time-behavior of an electrical signal by means of the non-linear Duffing equation. Derivation of an analytical solution in the absence of the damping and forcing contribution associated to the voltage generator. Derivation of a numerical solution for the complete equation as a function of the non-linear parameter and of the other characteristic parameters. Comparison with intensity current measured data in low voltage distribution systems.

- Study of metamaterial properties of 2D magnonic crystals and definition of metacrystals, of effective planes in reciprocal space and of effective scattering. Derivation of the Bragg law from the effective properties.

- Generalization of the effective length definition and of the effective wave vector to 2D periodic magnetic systems. Derivation of the relations between the effective wavelength and the effective wave vector and their corresponding wavelength and Bloch wave vector for both in-plane and perpendicularly magnetized 2D periodic magnetic systems.

- Calculation of the dynamic magnetic permeability of volume backward modes in an in-plane magnetized ferromagnet in the absence and in the presence of damping and in the magnetostatic approximation. Study of magnetic film as a metamaterial with negative magnetic permeability. Calculation of the group velocity of backward volume modes in magnetostatic approximation and in the presence of exchange interaction. Definition of effective “surface magnetic charges” and effective monopoles and its physical implications.

- Study of the topological dynamics in magnetic skyrmions in the presence of perpendicular polarized current and formulation of an analytical model for the calculation of the energy of the topological mode in the topological droplet state based on a variational derivation and on the linearization of the equations of motion for a magnetic system having an oscillator behavior. Comparison with results of micromagnetic simulations. Discussion of the phase diagram as a function of the polarized function and of the Dzyaloshinskii–Moriya interaction. Introduction of the concept of topological degeneracy and its implication in condensed matter physics.

- Study of the dynamics of the spin-wave mode in a ferromagnetic layer excited by a perpendicularly polarized current in the presence of a nano-contact and of the Dzyaloshinskii–Moriya interaction

Calculation of the corresponding eigenvector (confluent hypergeometric Riemann function) solution of the generalized confluent Riemann equation. Study of the transition from the cylindrical regime to the spiral regime at the threshold. Calculation of the threshold current and comparison with the threshold current calculated in the absence of the Dzyaloshinskii–Moriya interaction. Calculation of the group velocity in the cylindrical regime and in the spiral regime.

- Study of the dynamics of the excited spin-wave mode by an in-plane polarized Hall current in the presence of the Dzyaloshinskii–Moriya interaction and transition from the cylindrical to the spiral regime. Calculation of the threshold current.

- Study of the dynamics of the magnetic skyrmion in the hedgehog-like and vortex-like textures. Analytical derivation of the Thiele equation for the movement of the magnetic skyrmion in the presence of a Hall polarized current. Comparison between analytical calculations and micromagnetic simulations for the study of the behaviour of the magnetic skyrmion velocity as a function of the Hall current. Study of the confinement effects of the magnetic skyrmion in the presence of the spin Hall current and calculation of the dependence of the skyrmion velocity on the force due to confinement.

Research topics:

- Study of the collective mode frequencies in two-dimensional periodic arrays of antidots as a function of the external magnetic field by means of the micromagnetic Dynamical Matrix Method. Analysis of the frequencies of “soft modes” and study of the corresponding critical phase transition. Study of the dynamic critical phenomena and determination of dynamic critical exponents.

- Study of dispersions in three-dimensional ferromagnetic periodic systems formed by two magnetic materials (Py/Co) for different periodicities by means of the micromagnetic Dynamical Matrix Method and classification of collective modes. Comparison with the dispersion calculated by means of the plane wave method of AMU group (Poznan, Poland) and with Brillouin light scattering

measurements. Interpretation of opening of frequency band gaps through the analysis of the behavior of the internal field dependent on the two materials.

- Study of the effective properties in two-dimensional ferromagnetic antidot arrays. Definition of an effective wavelength, of an effective wave vector and of an effective ellipticity for spin-wave modes. Study of the relation between the effective wavelength and the Bloch wavelength and between the effective wave vector and the Bloch wave vector.

- Study of the metamaterial properties of one-dimensional and two-dimensional magnonic crystals by means of the micromagnetic Dynamical Matrix Method generalized to periodic magnetic systems.

- Study of dispersion in two-dimensional Permalloy ferromagnetic arrays by means of the micromagnetic Dynamical Matrix Method extended to periodic systems. Comparison with Brillouin light scattering measurements by CNISM group (University of Perugia). Interpretation of the band behavior along the high-symmetry directions for Damon-Eshbach geometry (wave vector perpendicular to the external magnetic field), collective mode classification and explanation of the opening of frequency band gaps for Bragg reflection by developing an analytical model based upon the internal field behavior.

- Study of the band diagram in two-dimensional systems of Permalloy interacting dots of circular shape by means of the micromagnetic Dynamical Matrix Method extended to periodic systems. Comparison with Brillouin light scattering measurements of CNISM group (University of Perugia). Interpretation of the behavior of magnonic bands along the high-symmetry directions both in the Damon-Eshbach scattering geometry (wave vector perpendicular to the external magnetic field) and in the backward volume scattering geometry (wave vector parallel to the external magnetic field) by means of the definition of an effective wave vector.

- Extension of the Dynamical Matrix Method to dissipative systems in the presence of both the intrinsic Gilbert damping and the damping term related to the polarized spin-current. Lagrangian formulation in terms of a generalized non-Hermitian and non-symmetric eigenvalue problem in the linear regime. Application of the method to a nanomagnet with autooscillatory behavior (nanopillar)

and analysis of the normal modes excited by the current. Case with perpendicular magnetization and with in-plane magnetization.

• Study of the static and dynamic magnetic properties in chains of rectangular nanodots with in-plane external field by means of the micromagnetic Dynamical Matrix Method extended to periodic systems. Calculation of magnonic bands amplitude and of frequency gaps for different configurations both in the Damon-Eshbach scattering geometry (wave vector perpendicular to the external magnetic field) and in the backward volume scattering geometry (wave vector parallel to the external magnetic field). Formulation of an empirical law to explain magnonic band behavior in one-dimensional systems. Comparison between micromagnetic calculations and Brillouin light scattering measurements of CNISM group of Perugia.

2006-2009: During the research activity under the contract of CNISM Researcher, III level at the Department of Physics, University of Ferrara, Italy (Supervisor: Prof. Fabrizio Nizzoli). Part of the research activity has been done during the Project PRIN No. 2007X3Y2Y2.

Research topics:

• Formulation of an analytical model for the study of nonlinear dynamics of frequency and amplitude modulators on spin-wave modes and comparison of results with those of micromagnetic calculations.

• Comparison between the Dynamical Matrix Method and another micromagnetic method for the calculation of normal modes excited by the d.c. current.

• Formulation of an analytical model of spin-wave modes in vortex-state cylindrical dots through the exact calculation of dynamic dipolar magnetic fields and the study of the effect of tridimensionality from nanometric to micrometric range. Comparison of theoretical results with Brillouin light scattering measurements, with Kerr microscopy measurements and with micromagnetic calculations.

- Study of the different kinds of spin-wave localized modes in cylindrical dots with in-plane magnetization by means of the application of the variational method for the calculation of normal mode frequencies .

- Formulation of a model for the calculation of spin-wave modes frequency spectrum in tangentially magnetized cylindrical dots based upon a variational method.

- Study of the most relevant spatial symmetries of the classical magnetic vortex.

- Study of the effect of the core region on normal modes energy in magnetic disks and calculation of the spectrum of gyrotropic modes in the vortex-state classified as "volume modes" of a continuous film governed by the exchange interaction. Extension of the analytical model of spin-wave modes in the vortex state to circular magnetic rings and comparison with micromagnetic calculations and measurements.

1999-2005: During the Post-doctoral fellowship at the Department of Physics, University of Ferrara, Italy (Supervisor: Prof. Fabrizio Nizzoli). Research activity during the period 2003-2005 has been done within the Projects PRIN No. 2003025857 and FIRB No. RBNE017XSW.

Research topics:

- Study of the effects of quantization on the dynamic properties of circular and rectangular magnetic dots and formulation of a theory of vortex spin modes in magnetic dots. In this group of papers the resonance modes frequencies and profiles inside confined systems are investigated both in the saturated and in the vortex state and the results are compared with the experimental Brillouin data. In particular, it has been predicted the existence of quantized volume spin modes ("backward-like" modes) confirming the Brillouin light scattering measurements and developing a theoretical models (see, in particular, publications n^o 26 and n^o 29). This work has been done in collaboration with CNISM group (Perugia).

- Study of the static and of the dynamical magnetic properties of films and multilayers. In this group of papers spin waves are determined and classified on the basis of their nature and the relative

scattering cross section is calculated for different static magnetic configurations. The calculations are compared with the experimental Brillouin data. Of special interest is the calculation of a spin excitation of acoustical nature with vanishing frequency in the infinite wavelength limit having the features of a soft mode of Goldstone nature.

1996-1999: During the PhD training at the Department of Physics, University of Modena, Italy (Supervisors Prof. Virginio Bortolani and Prof. Giorgio Santoro, Solid State Physics research group).

Research topics**:**

- Study of the effects of anharmonicity on the static and the dynamic properties of a simple metal (Aluminum) through the classical molecular dynamics technique. In this group of papers it is shown how multiphonon effects in Al crystals may affect the one-phonon volume and surface scattering cross section. Phononic linewidth and energy shift are calculated as a function of the transferred wave vector along the high-symmetry directions of two- and three dimensional Brillouin zone and are compared with experimental data recorded with the neutron scattering technique and with the He scattering data. The interpretation of Lunquist e of the Swedish group who have explained the the broadening of phonon linewidths in terms of a purely electronic effect (for example, electron-hole interaction) has been overcome by interpreting the broadening as a function of the transferred momentum and introducing the phonon anarmonicity in the nuclei interaction. The local behavior of Aluminum crystal in the premelting phase is also studied.

1994: Student working on the research thesis in Physics for the final degree in Physics at the Department of Physics, University of Modena (Supervisor: Prof. Giorgio Santoro).

Research topic:

- Study of the structural and of the dynamical properties of Copper using the Classical Molecular Dynamics technique and implemeting Molecular Dynamics codes.

SCIENTIFIC TITLES AND AWARDS

1) Winning of the Award “Outstanding Referee” by the American Physical Society (APS) for the APS journals (Physical Review and Physical Review Letters), 01/2016 equivalent of APS Journal Fellowship.

2) He is member of the American Physical Society (APS) by invitation since 10/2008.

3) He is member of the American Chemical Society (ACS) by invitation since 02/2013.

4) He is member of the Physical Mathematical Italian Society after a regular national competition.

5) He was the Lead Guest Editor by invitation of the journal “Advances in Condensed Matter Physics”: 12/2010-08/2012.

6) He is in the Editorial Board (Editor) of the journal “Advances in Materials Science and Applications” by invitation since 03/2013.

7) He was in the Editorial Board (Guest Editor) of the journal “Physica B” for the conference HMM 2013: 05/2013-08/2013.

8) He was invited to write a single author book entitled “Magnonic Metamaterials” by August 2017 that will be published by PanStanford Publishing.

9) He was chair of sessions at international Conferences.

10) He has given various presentations at international and national conferences and at scientific project meetings (about 30 contributed talks at conferences and 6 talks at meetings of European Projects).

11) He was a Keynote speaker at Workshop “Frontiers in Magnetism”, Messina, 17-18 June 2010.

12) He was an Invited Lecturer, Track 1-5 Nanomagnetism, at the 2nd Annual World Congress in Nanoscience and Technology, Xi'an, China, 25-28 September 2013.

13) He was an Invited Lecturer at the Energy, Materials and Nanotechnology Week meeting, Topic Metamaterials, Chengdu China, 22-26 October 2013.

14) He was an Invited Lecturer at the 3rd Annual World Congress at Expo of Advanced Materials 2014, Topic Basic Research in Metamaterials, 6-9 June 2014.

15) He was an Invited Lecturer at the Energy, Materials and Nanotechnology Week meeting, Topic Metamaterials, Chengdu China, 22-25 September 2014.

16) He was an Invited speaker a BIT's 1st Annual World Congress of Smart Materials-2015**,** Breaking Research of Smart Materials Science and Technologies, Busan, Republic of Korea, 23-25 March 2015.

17) He was an Invited speaker at Energy, Materials and Nanotechnology (EMN) Week meeting, Topic Spintronics and Photonics, Pukhet, Thailand, 04-07 May 2015.

18) He was an Invited speaker at Energy, Materials and Nanotechnology (EMN) Week meeting, Topic Spintronics and Photonics, Hong Kong, Hong Kong, 09-12 December 2015.

19) He was an Invited speaker at Energy, Materials and Nanotechnology (EMN) Week meeting, Topic Spintronics and Photonics, Hong Kong, Hong Kong, 09-12 December 2015.

20) He is referee of articles in high-impact international journals. In particular: Scientific Reports (Nature), Physical Review B, Physical Review E, Physical Review X, Physical Review Letters, IEEE Transactions on Magnetics, Applied Physics Letters, Journal of Applied Physics, Proceedings of Metamaterials'2012, Progress in Nanotechnology and Nanomaterials, Physica Scripta, Advances in Materials Science and Application, Physica B, Physics Letters A. Up to now he has reviewed about 130 articles, about 100 of them in Physical Review.

21) His biography was selected and published in the American Enciclopedia “Marquis Who’s Who in Science and Engineering” since 2003-2004, “Marquis Who’s Who in America” and “Marquis Who’s Who in the World” since 2006.

22) He was Fellowship at the University of Western Australia, Perth (Australia), Prof. Robert Stamps, February 2004-April 2004.

PUBLICATIONS ON INTERNATIONAL PEER-REVIEWED SCIENTIFIC JOURNALS, CONFERENCE PROCEEDINGS AND CONFERENCE PRESENTATIONS

66 PAPERS INDEXED BY SCOPUS

58 PAPERS INDEXED BY ISI WEB OF SCIENCE

10 single-authored papers

h-index: 15-16 (it depends on the database)

The following list is taken from the CINECA ITALIAN ACCOUNT https://loginmiur.cineca.it/

1) Vergura S., ZIVIERI R., Carpentieri M. (2016). Indices to Study the Electrical Power Signals in Active and Passive Distribution Lines: A Combined Analysis with Empirical Mode Decomposition. ENERGIES, vol. 9; p. 1-18, ISSN: 1996-1073, doi: 10.3390/en9030211

2) ZIVIERI R. (2016). Critical phenomena in ferromagnetic antidot lattices. AIP ADVANCES, vol. 6; p. 1-7, ISSN: 2158-3226, doi: 10.1063/1.4944666

3) Giordano A., Laudani A., Puliafito V., ZIVIERI R., Gubbiotti G., Azzerboni B., Carpentieri M., Finocchio G. (2016). Effect of the Oersted field and Dzyaloshinskii-Moriya interaction on the dynamical behavior of a spin-Hall oscillator - Presentazione orale - Conferenza internazionale. In: Technical program. Bormio, Italia, 14/03/2016 - 16/03/2016, Perugia: AIMagn, Dipartimento di Ingegneria Università di , p. 11-11

4) Carpentieri M., ZIVIERI R., Tomasello R., Finocchio G. (2016). Instanton droplet driven by spin-transfer torque in perpendicular materials with Dzyaloshinskii–Moriya Interaction. - Presentazione orale - Conferenza internazionale. In: MMM Intermag Advance Program. San Diego, California, 11/01/2016 - 15/01/2016, San Diego: IEEE Magnetics, p. 200-200

5) ZIVIERI R. (2016). Dynamic Critical Phenomena and Universal Behavior of Soft Modes in Low-Dimensional Periodic Magnetic Systems - Presentazione poster by R. Zivieri - Conferenza internazionale. In: MMM Intermag Advance Program. San Diego, California, 11/01/2016 - 15/01/2016, San Diego: AIP Publishing & IEEE Magnetics, p. 180-180

6) Malagò P., Giovannini L., ZIVIERI R., Gruszecki P., Krawczyk M. (2015). Spin-wave dynamics in permalloy/cobalt magnonic crystals in the presence of a nonmagnetic spacer. PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS, vol. 92; p. 1-10, ISSN: 1098-0121, doi: 10.1103/PhysRevB.92.064416

7) Malagò P., Giovannini L., ZIVIERI R. (2015). Perpendicularly Magnetized Antidot Lattice as a Two-Dimensional Magnonic Metamaterial - Presentazione poster by R. Zivieri - Conferenza internazionale. In: Proceedings Metamaterials 2015. Oxford, UK, 7-09-2015 - 12-09-2015, Roma: Metamorphose VI AISBL, p. 16-16

8) Carpentieri Mario, Tomasello Riccardo, ZIVIERI R., Finocchio Giovanni (2015). Topological, non-topological and instanton droplets driven by spin-transfer torque in materials with perpendicular magnetic anisotropy and Dzyaloshinskii-Moriya Interaction. SCIENTIFIC REPORTS, vol. 5; 16184, p 1-8. ISSN: 2045-2322, doi: 10.1038/srep16184

9) Malagò P., Giovannini L., ZIVIERI R. (2015). Perpendicularly magnetized antidot lattice as a two-dimensional magnonic metamaterial. In: 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials '2015). Oxford, UK, 7-09-2015 - 12-09-2015, Oxford, UK: Metamorphose, Virtual Institute, p. 535-537, ISBN/ISSN: 978-147997836-6, doi: 10.1109/MetaMaterials.2015.7342514

10) ZIVIERI R., Tomasello R., Carpentieri M., Finocchio G. (2015). Skyrmion motion induced by spin-Hall current in constrained geometries. In: INTERMAG 2015. Beijing, CHINA, May 11-15, 2015

11) Carpentieri M., Tomasello R., Finocchio G., ZIVIERI R. (2015). Topological Skyrmion Dynamics Driven by Spin-Transfer Torque. In: INTERMAG 2015. Beijing, CHINA, May 11-15, 2015

12) Finocchio G., Carpentieri M., Martinez E., ZIVIERI R., Tomasello R., Giordano A., Puliafito V., Ricci M., Torres L., Azzerboni B. (2015). Skyrmion racetrack memories and beyond. In: MAGNONICS 2015

13) ZIVIERI R. (2015). Dynamic Negative Permeability in a Lossless Ferromagnetic Medium. In: 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials '2015). Oxford, Regno Unito di Gran Bretagna, 7-12-09-2015Metamorphose, Virtual Institute, p. 532-534, doi: DOI: 10.1109/MetaMaterials.2015.7342513

14) ZIVIERI R. (2015). Magnetic matter spin waves with “negative” group velocity. In: 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials '2015). Oxford, Regno Unito di Gran Bretagna, 7-12-09-2015, Oxford: Metamorphose, Virtual Institute, p. 529-531, doi: 10.1109/MetaMaterials.2015.7342512

15) ZIVIERI R. (2015). Topological skyrmion dynamics in magnetic materials in the presence of a spin-polarized current - Invited talk. In: Nano S&T. Xi'an, China, 24-26-09-2015, Xi'an: BIT Congress Inc., p. 307-307

16) ZIVIERI R. (2015). Magnonic Crystals: a New Class of Metamaterials - Invited talk. In: BIt's 1st Annual World Congress of Smart Materials 2015. Busan, Republic of Korea, 23-25-03-2015, Busan: BIT Congress Inc., p. 359-359

17) Mario Carpentieri, Riccardo Tomasello, Giovanni Finocchio, ZIVIERI R. (2015). Topological skyrmion dynamics driven by spin-transfer torque. In: Proceedings Intermag 2015. Bejing, China, May 11-15, 2015, Pechino: IEEE Magnetics, p. 1-2, doi 10.1109/INTMAG.2015.7156848

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PAPERS ACCEPTED

1) R. Zivieri, "*Metamaterial properties of 2D ferromagnetic nanostructures: from continuous ferromagnetic films to magnonic crystals*" in Magnetic materials (Book).

2) R. Zivieri, S. Vergura, M. Carpentieri, "*Analytical and numerical solution to the nonlinear cubic Duffing equation: an application to electrical signal analysis of distribution lines*" in press in Applied Mathematical Modelling.

PAPERS SUBMITTED

1) R. Zivieri, "*Is scattering of collective modes in two-dimensional magnonic crystals an effective process?*" submitted to Physical Review Letters.

2) R. Zivieri, "*Dynamic permeability in a dissipative ferromagnetic medium*" submitted to Proceedings Metamaterials' 2016 Crete.

3) R. Zivieri, "*Effective diamagnetic behaviour of 2D magnonic crystals*" submitted to Proceedings Metamaterials' 2016 Crete.

4) A. Giordano, R. Zivieri, R. Verba, A. Laudani, V. Puliafito, G. Gubbiotti, R. Tomasello, G. Siracusano, B. Azzerboni, M. Carpentieri, A. Slavin, G. Finocchio, "*Nonreciprocal Slonczewski spin-waves excitation and single skyrmion nucleation by pure spin-current and Dzyaloshinskii Moriya interaction*", submitted to Nature Nanotechnology.

PAPERS IN PREPARATION

1) R. Zivieri "*On the equation of density of chirality in a magnetic vortex*".

2) R. Zivieri and G. Consolo, "*Space and time symmetries of the vortex-state linerized equation of motion*".

3) R. Zivieri, "*Symmetries of the classical magnetic vortex and magnetic skyrmions*".

4) R. Zivieri, "*Spin dynamics for magnetic disks and circular rings in the vortex-state: analytical calculations*".

PRESENTATIONS AT MEETINGS, SCHOOLS AND SEMINARS

1) *Dynamical matrix method applied to magnons in magnetic metamaterials*: International Advanced School on Magnonics, Santa Margherita Ligure (Italy), September 2012. Poster summarizing the research activity of the European Project Magnonics.

2) *Dynamical matrix method in the presence of an external periodic applied field: susceptibility calculations*: M24 Meeting European Project Magnonics, Barcelona (Spain), October 2011. Talk.

3) *Spin waves in ferromagnetic antidot lattices: from single to binary component magnonic metamaterials*: M24 Meeting European Project Magnonics, Barcelona (Spain), October 2011. Talk.

4) *Metamaterial properties of ferromagnetic antidot lattices*: M24 Meeting European Project Magnonics, Barcelona (Spain), October 2011. Talk.

5) *Dynamical properties of 2D circular magnetic antidots*: M18 Meeting European Project Magnonics, Poznan (Poland), March 2011. Talk.

6) *Dynamical properties of 1D and 2D magnonic crystals*: *ongoing work*: M12 Meeting European Project Magnonics, Perugia (Italy), September 2010. Talk.

7) *Theoretical analysis of magnonic crystals and modeling of experimental data*: Kick-off Meeting European Project Magnonics, Exeter (Regno Unito), September 2009. Talk.

8) *Spin modes in magnetic dots*: during the visit at the Department of Physics, University of Western Australia, Perth (Australia), March 2004. Talk.

"Il sottoscritto acconsente, ai sensi del D.Lgs. 30/06/2003 n.196, al trattamento dei propri dati personali e alla pubblicazione del presente curriculum vitae sul sito dell'Università di Ferrara"

Ferrara, lì 22/04/2016 Roberto Zivieri

Firma di autorizzazione