Curriculum Vitae

March 2024

RENZO LUIGI RICCA

Personal Details

Date of birth: January 24, 1960. Place of birth: Casale Monferrato (AL), Italy.
Citizenship: Italian and British. Married to Pia Truc; 2 children: Joël, Jolie.
Office: Department of Mathematics and Applications, U. Milano-Bicocca (UniMiB).
E-mail: renzo.ricca@unimib.it - URL: https://www.renzoricca.com/

Education

Ph.D. (Mathematics) (16.07.1994). U. Cambridge (Trinity College). Thesis title: *Geometric and topological aspects of vortex filament motion*. Supervisor: Professor H.K. Moffatt
M.Sci. (15.08.1989). U. Cambridge (Trinity College). Advisor: Professor H.K. Moffatt
Laurea Degree (30.03.1989). Politecnico di Torino. Thesis title: *Study of a vortex filament* (in Italian). Advisors: Professors M. Germano and M.G. Rasetti

Appointments

2004-to present Professor of Mathematical Physics (2008- Tenured), U. Milano-Bicocca
1998-2003 Senior Research Fellow and Lecturer, University College London
1993-1995 Research Associate, Politecnico di Torino
1992-1997 Research Assistant and Fellow, University College London

Visiting Positions

2023-to date, SKCM2 World Premier Institute Affiliate Member, Hiroshima U., Japan
2016-to date, (from 2023 Distinguished) Guest Professor, Beijing U. Technology
2022, 2008 Erasmus Professor, Laboratoire Dieudonné, U. Côte d'Azur, Nice
2019 Erasmus Professor, Department of Mathematics, U. Crete
2005-2007, Senior Visitor, DAMTP, U. Cambridge
2003-2004 Visiting Professor, University College London
2002-2003 Visiting Professor, École Normale Superieure, Paris
2001 JSPS Visiting Fellow, Kyushu University
2000 EPSRC Senior Research Fellow, Isaac Newton Institute, Cambridge
1997-1998 Senior Scientist, ISIS, EC-Joint Research Centre, Ispra
1996, 1997, 2000 Visiting Professor, Department of Mathematics, U. Geneva
1992 Visiting Post-Doc, Institute for Advanced Study, Princeton
1991 Research Affiliate, Institute for Theoretical Physics, UC Santa Barbara
1989-1992 Research Associate, DAMTP, U. Cambridge

Bibliometric Data and Impact

- ORCID ID: 0000-0002-7304-4042
- Google Scholar: h-index = 25; i10-index = 45; 2706 citations
- SCOPUS (65 items): h-index: 19, 1190 citations
- ISI-Web of Science (67 items): h-index = 19; sum of times cited: 1441

International Recognition and Awards

(i) Awards and Distinctions

2013 *Habilitation to Full Professorship*, Sector 01/A4. MIUR, Italian Ministry of Education, Italy.
2007-2008 *Lagrange Senior Research Fellowship*, ISI & CRT Foundation, Torino, Italy.
2003-2007 *Return Scholarship* ("Incentivazione alla mobilità di studiosi stranieri e italiani residenti all'estero"), MIUR, Italian Ministry of Education, Italy.
2001 *JSPS Fellowship*, Japan Society for the Promotion of Science, Japan.
1991 *J.T. Knight Prize* (Mathematics). University of Cambridge, UK.
1989-1992 *ASP Scholarship*, ASP, Torino, Italy.

(ii) Scientific Boards and Panels

2016-to date Editorial Board Member for Mathematical Physics, *Nature Scientific Reports*, Nature-Springer.
2013-2018 Reviewer, *Zentralblatt MATH*, Berlin, Germany.
2010-2018 Reviewer, FET-Open Scheme, European Commission, Brussels.

(iii) Entries in Biographical Records

2002-2020 *Who's Who in the World*. Marquis Pubs., New York, USA.
2006-2018 *Outstanding Scientists of the XXI Century.* Intnl. Biogr. Centre, Cambridge, UK.
2004-2018 *Who's Who in Science & Technology*. Marquis Pubs., New York, USA.

Organization and Direction of International Programs

(i) Long Term Research Programs

2019 (August-September) Scientific Director and Principal Organiser, *Knotted Fields,* Beijing U. Technology (BJUT) & Northwestern U., Xi'an.
2011 (May-July) Scientific Director and Principal Organiser, *Knots and Applications*. Mathematics Research Centre «Ennio De Giorgi», Scuola Normale Superiore, Pisa.
2000 (September-December) Program Organiser, *Geometry and Topology of Fluid Flows*. Isaac Newton Institute for Mathematical Sciences, Cambridge.

(ii) Summer Schools, Workshops and International Conferences

2024 (January) Co-Organiser, GEOTOP-A Intnl. Conference *Applications of Geometry and Topology*. Autonomous U. Yucatán (UADY), Mérida, México.
2022 (September) Principal Organiser, 74th School of Mathematics «Guido Stampacchia» & Intnl. Workshop *Topological Methods in Mathematical Physics*. Majorana Foundation and Centre for Scientific Culture, Erice (Sicily).
2021 (January) Chair and Principal Organiser, Intnl. Meeting *Applications of Geometry and Topology to Modern Physics* (online).
2019 (September) Chair and Principal Organiser, Intnl. Summer School (Beijing), *Knotted Fields and Applications*. Beijing U. Technology (BJUT), Beijing.
2019 (July) Organiser, *SIAM-AG19 From Algebraic Geometry to Geometric Topology: Crossroads on Application*s. U. Bern.
2016 (April) Chair and Principal Organiser, IUTAM Symposium *Helicity, Structures and Singularity in Fluid and Plasma Dynamics*. Istituto Veneto di Scienze Lettere ed Arti, Venice.
2011 (July) Chair and Principal Organiser, Workshop *Topological Dynamics in Physics and Biology*. Ennio De Giorgi Mathematics Research Centre, Scuola Normale Superiore, Pisa.
2011 (July) Chair and Principal Organiser, ESF-EMS-ERCOM Conference *Knots and Links: from Form to Function*. Ennio De Giorgi Mathematics Research Centre, Scuola Normale Superiore, Pisa.

2011 (May) Chair and Principal Organiser, Pedagogical School *Knots and Links: From Theory to Applications*. Ennio De Giorgi Mathematics Research Centre, Scuola Normale Superiore, Pisa.
2001 (June) Scientific Director, CIME Summer School *Topological Fluid Mechanics*. International Mathematical Summer Center, CIME Foundation, UMI, Italy.
2000 (October) Organiser, LMS Spitalfields Days *In Search of the Ideal Knot*. Isaac Newton Institute for Mathematical Sciences, Cambridge.
2000 (September) Scientific Director, NATO-ASI *Pedagogical Workshop on the Geometry and Topology of Fluid Flows*. Isaac Newton Institute for Mathematical Sciences, Cambridge.
1996 (May) Organiser, *UK-MHD Meeting*. University College London.

(iii) Science Promotion

2018-to date Founding and Scientific Committee Member, *GEOTOP-A.* Intnl. web-seminar series: http://seminargeotop-a.com
2021 Founding Member, *The Association for Mathematical Research.* https://amathr.org/

Scientific Contributions at International Conferences

(i) Keynote and Invited Lectures

2023 (September) On the energy and helicity of inflexional magnetic braids. *NAOC Colloquium*. National Observatories of the Chinese Academy of Sciences, Beijing.
2023 (March) The beautiful interplay of topology and physics. *Kick-off Symposium*. SKCM2 Premier World Institute. Hiroshima U.
2019 (November) New routes to quantify topological complexity by adapted polynomials. *EUTOPIA Annual Meeting 2019.* San Sebastian.
2019 (September) Progress in topological quantum vortex dynamics. *Frontier Problems of Theoretical Physics*. Northwestern U., Xi'an.
2019 (June) Minimal unlinking pathways as geodesics in polynomial space. *BAGEL19 Workshop.* Institute for Mathematics and its Applications. Minneapolis.
2017 (September) Quantum vortex dynamics by Seifert surface information. *Form and Deformation in Fluid and Solid Mechanics.* Isaac Newton Institute for Mathematical Sciences, Cambridge.
2015 (June) From magnetic helicity to energy-complexity relations for solar loops. *IRF-MSB Forecast and Warnings of Extreme Storms at the Sun*, Lund, Sweden.
2014 (June) From "multiple continuity" to modern topological field theory. *Riemann, Topology and Physics*, U. Strasbourg, France.
2013 (November) Knot polynomials as new tool for turbulence research. *Turbulence & Wave Processes*, Lomonosov Moscow State U., Russia.
2012 (June) Recent progress in topological fluid dynamics: from helicity to Jones polynomials. *Knotted Fields*. Kavli Institute for Theoretical Physics, UC Santa Barbara, USA.
2012 (March) Tackling structural complexity in vortex dynamics, *Vortices and Solitons in Classical and Quantum Fluids*. CIRM, Marseille, France.
2009 (March) Topology bounds the energy of knots and links. *Edinburgh Mathematical Society Meeting*, Dundee, UK.

(ii) Lectures at Special Events

2019 (November) GPE defect production by phase twist injection as Aharonov-Bohm effect. *EUTOPIA Annual Meeting.* WG5, San Sebastian.
2017 (October) Knot polynomials as a new tool for turbulence research. *FIMA Day,* Consiglio Nazionale delle Ricerche, Rome, Italy.
2017 (February) Knots and Applications. *La Matematica nel Mondo Contemporaneo.* Accademia dei Lincei e Scuola Normale Superiore, Pisa, Italy.

2014 (May) Roundtable on *Geometrical Aspects of Hydrodynamics*, Simon Center for Geometry and Physics, Stony Brook (NY), USA
2012 (October) From the theory of knots to the topology of chaos. *I Mercoledi della Scienza.* Fondazione di Piacenza e Vigevano, Piacenza, Italy.
2012 (September) Roundtable *ICNAAM. Symp. On Complex Systems*, Kos, Greece.
2012 (June) Roundtable on *Knotted Fields*. Kavli Institute for Theoretical Physics, UC Santa Barbara, USA.
2007 (October) Detecting structural complexity by computational fluid dynamics. Round Table *CAPI 2007*. CILEA, Politecnico di Milano.
2006 (February) Modern developments in mathematical biology. *Mathematical Modeling and Systems Biology*. Canavese Bio-industry Park, Ivrea, Italy.
2005 (April) Magnetic knots and minimal braids. *Turbulence, Twist and Treacle - Meeting in Celebration of 70th Birthday of H.K. Moffatt*. Isaac Newton Institute, Cambridge, UK.
2003 (November) Energy-complexity relations for vortex flows. *Colloquium in Honor of J.J. Moreau*, Laboratoire de Mèchanique et Genie Civil, U. Montpellier II.
2000 (May) From Kelvin vortex knots to turbulence. *IMA World Mathematical Year Millennium Event.* The Institute of Mathematics and Its Applications, London.

(iii) Oral Contributions

2024 (January) Proof of quantized circulation and zero-helicity condition for quantum knots and links. *Applications of Geometry and Topology*. Autonomous U. Yucatán (UADY), Mérida, México.
2023 (December) Quantum vortex knots and links under zero helicity condition. *Vortex Dynamics: the Crossroads of Mathematics, Physics and Applications.* BIRS Institute for Advanced Mathematics, Hangzhou.
2023 (November) A topological route to superfluid turbulence. *LMFL Fluid Mechanics Webinar Series*, U. Lille (online).
2023 (April) On quantum vortex knots and links. *Quantum Topology Webinar Series*. U. Illinois at Chicago (online).
2022 (September) Multi-valued potentials and physical reality. *Topological Methods in Mathematical Physics*. Majorana Foundation, Erice.
2022 (May) Vortex dynamics by geometric and topological methods. *IQM22,* Politecnico di Milano.
2021 (October) Minimal unlinking pathways as geodesics in knot polynomial space. *Helicity and space-time symmetry*. Advanced Mathematical Institute (OCAMI), Osaka (online).
2021 (August) Twist effects of quantum vortex defect. *Dynamics Days XV*. U. de la Côte d'Azur Nice.
2021 (January) Vortex reconnection in classical and quantum systems. *Applications of Geometry and Topology to Topics of Modern Physics*. BJUT & Bicocca (online).
2020 (September) Recent developments in topological field theory. IC-MSQUARE *Mathematical Modeling in Physical Sciences*. Tinos Island (online).
2020 (August) Topological cascade through vortex reconnection. *Physical Knotting, Vortices and Surgery in Nature*. Novosibirsk (online).
2019 (October) Quantum vortex dynamics by geometric and topological methods. *Waves, Coherent Structures and Turbulence.* U. East Anglia, Norwich.
2019 (September) Defect production by phase twist injection as Aharonov-Bohm effects. *Knotted Fields and Application*s. BJUT, Beijing.
2019 (July) Momentum of vortex tangles by weighted area information. *SIAM-From algebraic geometry to geometric topology: crossroads on application*s. U. Bern.
2018 (November) Writhe and twist helicity in quantum vortex systems. *From many Particle Systems to Quantum Fluids.* Gran Sasso Science Institute, L'Aquila.

2018 (November) Geometric devils in topological dynamics. *GEOTOP-A Webinar Series*. http://seminargeotop-a.com (online).
2018 (January) Quantum vortex dynamics by signed area information. *Phonon Hydrodynamics in Solid and Superfluids.* U. Palermo.
2017 (June) Influence of winding number on vortex torus knots dynamics. *IUTAM Symposium Dynamics and Topology of Vorticity and Vortices*. Carry-le-Rouet.
2016 (September) Vortex knots cascade by HOMFLYPT polynomial. *Knots and Links in Biological and Soft Matter Systems.* ICTP, Trieste.
2016 (July) Knots cascade detected by a monotonically decreasing sequence of HOMFLYPT values. *Knots, Low Dimensional Topology & Applications - Knots in Hellas 2016*. IOA, Ancient Olympia, Greece.
2016 (July) Vortex knots cascade by HOMFLYPT polynomial. *XI AIMS Dynamical Systems, Diff. Equations and Applications – Session on Vortex Dynamics*. Orlando, FL.
2016 (June) Vortex knots cascade by HOMFLYPT polynomial. *EUROMECH Colloquium 581*, Institute of Thermophysics, SB RAS, Novosibirsk, Russia.
2015 (September) Geometric daemons in topological dynamics. *IMRA Geometry and Biophysics,* Strasbourg, France.
2015 (August) HOMFLYPT polynomial for vortex knots and cascade process. *Knots in Theory and Science*, Basel, Switzerland.
2015 (April) From helicity to the HOMFLYPT polynomial of fluid knots and links. *Knots and Links in Fluid Flows,* Moscow Independent U., Moscow.
2014 (September) Groundstate energy and topological complexity of magnetic knots. *Knots in Soft Condensed Matter*, Vienna, Austria.
2014 (June) Writhe helicity conservation under anti-parallel reconnection. *ESF Reconnection Events in Classical, Quantum and Magnetized Fluids*, Glasgow U., UK.
2014 (March) Relaxation of magnetic knots to braids and groundstate energy minima. *CAKE*, Max Planck Institut Leipzig, Germany.
2013 (March) The Jones polynomial as a new invariant of fluid dynamics. *IUTAM Vortex Dynamics: Formation, Structure and Function*, Fukuoka, Japan.
2012 (December) On the energy spectrum of knots and links. *Quantized Flux in Tightly Knotted and Linked Systems,* Cambridge, UK.
2012 (October) Topological bounds on the energy and complexity of magnetic fields. *Tangled Magnetic Fields in Astro- and Plasma Physics*, Edinburgh, UK.
2012 (September) Tackling fluid tangles complexity by knot polynomials. *ICNAAM Symp. on Complex Systems*, Kos, Greece.
2012 (July) Impulse of vortex knots from diagram projections. *IUTAM Topological Fluid Dynamics*, Cambridge, UK.
2011 (September) Energy-complexity relations by structural complexity methods. *ICNAAM Symp. on Complex Systems*, Halkidiki, Greece.
2011 (July) On the groundstate energy spectrum of magnetic knots. *ESF-EMS-ERCOM Knots and Links: from Form to Function*. Ennio De Giorgi Mathematics Research Centre, Scuola Normale Superiore, Pisa.
2011 (June) Topological dynamics by structural complexity methods. *Topology in Fluid Flow Visualization*. Ennio De Giorgi Mathematical Research Centre, Scuola Normale Superiore, Pisa.
2011 (May) From Gauss' derivation of linking number to its rôle in modern topological dynamics. *Entanglement and Linking*. Ennio De Giorgi Mathematical Research Centre, Scuola Normale Superiore, Pisa.
2010 (June) Topological dynamics by structural complexity analysis. *VI Conf. on Dynamical Systems and Applications*, Antalya, Turkey.

2010 (May) New lower bounds on the energy of knots and braids. *VIII AIMS Conf. Dynamical Systems, Differential Equations and Applications*, Special Session on "Magnetohydrodynamics: Mathematical Problems and Astrophysical Applications", Dresden, Germany.
2010 (May) Vortex dynamics estimates by structural complexity analysis. *VIII AIMS Conf. Dynamical Systems, Differential Equations and Applications*, Special Session on "New Trends in Mathematical Fluid Dynamics", Dresden, Germany.
2009 (August) Topology bounds the energy of knots and links. *XVI ICMP*. Prague, Check Republic.
2009 (May) Topology bounds the energy of knots and links. *Knots and Applications,* ICTP, Trieste, Italy.
2008 (September) On the groundstate energy of knotted magnetic flux tubes. *EURO MHD 2008.* Nice, France.
2008 (May) Detecting structural complexity: from visiometrics to genomics and brain research. *MathKnow08*. Politecnico di Milano, Italy.
2008 (April) From Da Rios' equations to integrable vortex dynamics. *Nonlinearity & Geometry: Darboux Days*. Bedlewo, Poland.
2007 (July) A new Stretch-Twist-Fold model for fast dynamo. *ICIAM '07*. Zürich, Switzerland.
2006 (March) Twist and fold modeling of supercoiled filaments. *Knots and Macromolecules*. Istituto Veneto di Scienze, Lettere ed Arti, Venice, Italy.
2006 (January) Twist and fold modeling for DNA supercoiling. I FIMA Int. Conf. *Models and Methods for Human Genomics*. Champoluc-Ayas, Italy.
2005 (September) Measures of structural complexity for vortex flows. *Singularities, coherent structures and their role in intermittent turbulence*. U. Warwick, UK.
2005 (August) Linear and angular momentum of a vortex tangle. *High Reynolds Number Vortex Interactions*. Tolouse, France.
2005 (June) From vortex rings, to knots and links. *Vortex Rings and Filaments in Classical and Quantum Systems*. ICTP, Trieste, Italy.
2003 (June) Energy-complexity relations for vortex flows. *Fluxes and Structures in Fluids*. Saint Petersburg, Russia.
2002 (July) On Kelvin's vortex knots. *Geometry, Symmetry and Mechanics*. U. Warwick, UK.
2002 (July) Measuring structural complexity of fluid flows. *Fundamentals of Vortices, Convection and Turbulence in Rotating Flows.* U. College London.
2001 (December) In search of symmetries in magnetic knots. *Geometric Mechanics and Symmetry*. U. Warwick, UK.
2001 (January) From fluid knots to complex systems. *Knots in Science*. MAA-AMS Joint Mathematics Meetings, New Orleans, USA.
2000 (November) Asymptotic potential theory for slender tubes, intrinsic kinematics and minimal surfaces. *BRIMS Day*. Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.
2000 (October) A history of Kelvin's vortex knots. *Spitalfields Day*. Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.
2000 (August) Relaxation of magnetic knots. *XVI IMACS World Congress*. Lausanne, Switzerland.
1998 (August) Topological ideas in vortex dynamics. *Knots in Hellas '98*. Delphi, Greece.
1997 (June) Inflexional disequilibrium of elastic and magnetic knots. *Mathematics and Mechanics for Materials Science and Molecular Biology*. Capri, Italy.
1995 (August) New developments in topological fluid mechanics. *Knot Theory and Applications*. Stefan Banach International Mathematical Centre, Warsaw, Poland.
1994 (May) The Călugăreanu invariant in topological fluid mechanics. *Romania and Romanians in Contemporary Science.* Sinaia, Romania.

1990 (June) Invariants of the Da Rios-Betchov equations. *Generation of Large-Scale Structures in Continuous Media.* Perm, Soviet Union.

Teaching at International and National Summer School

(i) International Summer Schools

2023 (June) "Topological Vortex Dynamics" (10 hours). Summer School on Mathematical Fluid Dynamics, Cargèse.

2022 (September) "An Introduction to Topological Magnetohydrodynamics" (10 hours). Laboratoire Dieudonné, U. Côte d'Azur.

2018 (September) "An Introduction to Topological Fluid Dynamics" (8 hours). Beijing U. Technology.

2017 (June) "Aspects of Topological Fluid Mechanics" (3 hours). Early Summer School on Contemporary Aspects, Overview and Outlook on Knots. Freiburg U..

2014 (September) "Intrinsic Kinematics of Strings" (1 hour). Summer School on Finsler Geometry with Applications. Samos Island, Greece.

2012 (September) "Topological Magnetohydrodynamics" (6 hours). IAR School on Fluid Mechanics and Magneto-hydrodynamics. ITAP, Marmaris, Turkey.

2011 (May) "Physical Knot Theory" (6 hours). Pedagogical School on Knots and Links: From Theory to Applications. Ennio De Giorgi Mathematical Research Centre, Scuola Normale Superiore, Pisa.

2001 (June) "Elements of Topological Fluid Mechanics" (5 hours). CIME Summer School on Topological Fluid Mechanics. Unione Matematica Italiana, Cetraro, Italy.

2000 (June) "Revisiting Gauss Linking Number" (3 hours). Summer School on Geometric and Topological Methods in Dynamical Systems. U. Bourgogne, Dijon, France.

1998 (September) "From Fluid Knots to Structural Complexity" (4 hours). EC Summer School on Turbulence and Applications. Landau Network and EC-JRC Ispra, Centre "A. Volta", Como, Italy.

1996 (May) "Magnetic Knots and Applications" (4 hours). Summer School on Vortex and Flux Tubes: Observations, Stability, Topology. Observatoire de la Côte d'Azur, Nice, France.

(ii) National Summer Schools

2017 (September) "Topological Fluid Mechanics" (6 hours). GNFM and INdAM Summer School on Mathematical Physics. Unione Matematica Italiana, Ravello.

2017 (February) "From the Mathematics of Knots to DNA Topology" (3 hours). Scuola Normale Superiore & Accademia Lincei, Pisa.

2007 (September) "An Introduction to Structural Complexity" (1 hour). Summer School on Mathematics and Physics. MatNet & U. Bergamo, San Pellegrino, Italy.

1995 (December) "Linking and Self-linking of Elastic filaments" (2 hours). Workshop on Mathematical Methods in Materials Science. IAC-CNR, Rome, Italy.

1995 (May) "Applications of the Călugăreanu invariant" (3 hours). Workshop on Geometry and Topology in Low Dimensions. Scuola Normale Superiore & U. Pisa, Italy.

Teaching for University Courses

(i) Doctoral Degree (III level)

2021 "Knotted Fields" (30 hours). Dept. Mathematics and Applications, UniMiB.

2018 "Classical and Quantum Knots – Theory and Applications" (20 hours). Dept. Mathematics and Applications, UniMiB.

2008 "Geometric and Topological Vortex Dynamics" (10 hours). Laboratoire J.A. Dieudonné, U. Nice Sophia Antipolis.

2008 "Physical Applications of Knot Theory" (6 hours). Dept. Methods and Models for Mathematics, U. Rome "La Sapienza".

2006 "Physical Applications of Knot Theory" (20 hours). Dept. Mathematics, Politecnico di Torino.
2005 "Elements of Topological Fluid Mechanics" (10 hours). Dept. Mathematics and Applications, UniMiB.
2002 "An Introduction to Geometric and Topological Magnetohydrodynamics" (6 hours). Dept. Advanced Science and Technology, U. Piemonte Orientale.
2001 "Lectures on Topological Fluid Mechanics" (20 hours). Research Institute for Mathematical Sciences, Kyoto U..
2000 "Geometric and Topological Aspects of Fluid Dynamics" (10 hours). Dept. Mathematics, U. Geneva.

(ii) Master Degree (II level)

2015-to date Topological Methods in Field Theories (formerly Mathematical Methods for Modern Physics), UniMiB.
2019 Erasmus Course: Hydrodynamics for Condensates, U. Crete.
2009-2011 Applied Mathematics (BioInformatics), UniMiB.
2009 Erasmus Course: Topological Magnetohydrodynamics, Laboratoire J.A. Dieudonné, U. Nice Sophia Antipolis.
2004-2008 Physical Theories and Mathematical Models, UniMiB.
2003 Mathematical Methods III (M241), UCL.
1994-1998 Mathematical Methods (Hydrogeology), U. College London.
1995 (April) Geometric Methods in Fluid Mechanics. Scuola Normale Superiore, Pisa.

(iii) Bachelor Degree (I level)

2011-to date Mathematics (Biological Sciences), UniMiB.
2008-2011, 2013-2014 Mathematics II (Chemistry), UniMiB.
2010-2013 Mathematical Models and Differential Equations, UniMiB.
2008-2010 Elements of Mathematics II (Chemistry), UniMiB.
2003 Elementary Mathematics (A1A), UCL.
2002 Mathematics (B51B, Economics, Statistics), UCL.
1997-1998 Mathematics II (A3, Physical Sciences), UCL.
1997-1998 Mathematical Methods (B6, Chemistry), UCL.

University Offices

(i) Direction and Examination of PhD and Master Projects

Direction of Ph.D. projects: Francesca Maggioni (2004-2006); Chiara Oberti (2011-2015); Franz Schlöder (2016-2020); Matteo Foresti (2016-2022); Alice Roitberg (2018-2023); Hao Guan (at BJUT, 2022-to date); Martina Luise (at U. Trento, 2022-to date), Samuele Faglioni (at Hiroshima U., 2023-to date).

Examination of Ph.D. candidates: A. Xiong (U. Birmingham, 2022); S. Candelaresi (NORDITA, Stockholm U., 2012); J.N. Hartnack (Technical U. Denmark, 1999).

Supervision of Master thesis projects: more than 60 students to date.

(v) University Offices

Internationalization and Erasmus Coordinator, UniMiB Internationalization Committee.

Fund-Raising and Research-Related Activities

(i) Funded Research Projects

2023 Natural Science Foundation of China (NSFC) Grant N. 11572005 *Topological Fluid Mechanics* (PI, BJUT).
2019 Fondo di Ateneo Quota Competitiva (FAQC) *Geometric and Topological Aspects of Knotted Fields and Applications* (PI, UniMiB).

2016 Natural Science Foundation of China (NSFC) Grant N. 11572005 *Topological Fluid Mechanics* (Co-PI, BDIC-BJUT).
2010 INdAM-ESF funding for Intensive Research Trimester *Knots and Applications* (PI, UniMiB-U. Pisa).
2006-2010 MIUR COFIN 2006-PRIN Project: *Geometric Methods in the Theory of Non-Linear Waves and Applications* (co-applicant, SISSA-Trieste).
2004-2006 MIUR COFIN 2004-PRIN Project: *Mathematical Models for DNA Dynamics* M^2xD^2 (co-applicant, U. Milano).
2003-2007 MIUR Research Project: *Measures of Complexity and Energy for Fluid Systems* (PI, UniMiB).
2001-2004 The Royal Society of London, Joint Research Project: *Physical Knots* (PI, UK-U. Lausanne).
2000 London Math. Society, Collaborative grant: *Vortex Knots in Ideal Fluids* (PI, UCL-U. Warwick).
1998-1999 Swiss National Science Foundation, Project: *Knot Theory and Applied Topology* (co-applicant, U. Geneva).
1998 PPARC, Project: *The Energy and Topology of Coronal Magnetic Fields* (co-applicant, UCL).
1997 UK-USA NSF, Project: *Topology in Heliosphere* (co-applicant, JPL, Pasadena).
1994 The Leverhulme Trust, Project: *Energetic and Topological Aspects of Magnetic Field Structures* (co-applicant, UCL).
1994 PPARC, Project: *The Structure and Energy of Coronal Magnetic Fields* (co-applicant, UCL).

(ii) Reviewing and Peer Refereeing

– Reviewing for intnl. funding projects: NSF (USA), EPSRC (UK), EC-FET (EU).
– Refereeing for primary journals: JFM, Fluid Dyn.Res., JKTR, PRL, Proc.R.Soc., Phys.Rev., J. Phys A, and many others.
– Refereeing for intnl. publishers: Imperial College Press, Springer-Verlag, World Scientific.

Referees

Europe Professor C.F. Barenghi (U. Newcastle, UK): carlo.barenghi@newcastle.ac.uk
Professor M. Farge (Ecole Normale Supérieure Paris, France): marie.farge@ens.fr
Professor H.K. Moffatt (U. Cambridge, UK): hkm2@damtp.cam.ac.uk
Professor A. Niemi (Uppsala U., Sweden): antti.niemi@me.com
• Professor D. Ruelle (IHES, Bures-sur-Yvette, France): ruelle@ihes.fr

USA • Professor L.H. Kauffman (U. Illinois at Chicago, USA): kauffman@uic.edu
• Professor K.R. Sreenivasan (Courant Institute, New York U., USA): krs3@nyu.edu
• Professor De W.L. Sumners (Florida State U., USA): sumners@math.fsu.edu

Asia • Professor T. Kambe (Tokyo, Japan): kambe@ruby.dti.ne.jp
• Professor Z.-S. She (U. Peking, P.R. China): she@pku.edu.cn

List of Publications

Articles in Primary Journals and Refereed Volumes

[1] **Ricca, R.L.** (1991) Intrinsic equations for the kinematics of a classical vortex string in higher dimensions. *Physical Review A* **43**, 4281-4288.

[2] **Ricca, R.L.** (1991) Rediscovery of Da Rios equations. *Nature* **352**, 561-562.

[3] Moffatt, H.K. & **Ricca, R.L.** (1991) Interpretation of invariants of the Betchov-Da Rios equations and of the Euler equations. In *The Global Geometry of Turbulence* (ed. J. Jimènez), NATO ASI B **268**, pp. 257-264. Plenum Press.

[4] **Ricca, R.L.** & Moffatt, H.K. (1992) The helicity of a knotted vortex filament. In *Topological Aspects of the Dynamics of Fluids and Plasmas* (ed. H.K. Moffatt *et al.*), pp. 225-236. Kluwer.

[5] **Ricca, R.L.** (1992) Physical interpretation of certain invariants for vortex filament motion under LIA. *Phys. Fluids A* **4**, 938-944.

[6] Moffatt, H.K. & **Ricca, R.L.** (1992) Helicity and the Călugăreanu invariant. *Proc. R. Soc. A* **439**, 411-429. [Also in: (1995) *Knots and Applications* (ed. L.H. Kauffman), pp. 251-269. World Scientific.]

[7] **Ricca, R.L.** (1993) Torus knots and polynomial invariants for a class of soliton equations. *Chaos* **3**, 83-91. [1995 Erratum. *Chaos* **5**, 346.]

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