Curriculum Vitae
Raffaele Vitolo

December 20, 2017
Lecce, Italy

GENERAL INFORMATION

PERSONAL DATA

Born   1966, currently living in Lecce, Italy

Address   Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, Via per Arnesano, 73100 Lecce, Italy.

Email   raffaele.vitolo@unisalento.it

WWW   http://poincare.unisalento.it/vitolo/

EDUCATION

1990   Perugia Summer School (by Scuola Matematica Interuniversitaria http://www.matapp.unimib.it/smi/);

1991   Degree in Mathematics: Università di Camerino, 1991

1991   Cortona Summer School (by Scuola Matematica Interuniversitaria http://www.matapp.unimib.it/smi/);

1994   Ravello Summer School (by GNFM of Istituto Nazionale di Alta Matematica, http://www.altamatematica.it/)

1996   Ravello Summer School (by GNFM of Istituto Nazionale di Alta Matematica, http://www.altamatematica.it/)

1996   Ph.D. in Mathematics Università di Firenze, 1996.

1998   'Diffiety School' (courses by A.M. Vinogradov, Un. Salerno, and I.S. Krasil'shchik, Independent Univ. of Moscow), on the geometry of PDE, Forino (AV, Italy)

1998	'Homological methods in PDE' (courses by I.S. Krasil'shchik and A.M. Verbovetsky, Un. Mosca), Levoča (Slovakia).

CAREER

1990-1991	Consiglio Nazionale delle Ricerche (`http://www.cnr.it`) fellowship for graduate students;
1991-1995	Ph.D. fellowship, University of Florence;
1996-1997	Istituto Nazionale di Alta Matematica (`http://www.altamatematica.it/`) research fellow;
1997	Foundation 'F. Severi' fellowship.
1997-1998	Post-doc fellowship, University of Florence;
1998-2003	Assistant professor ('ricercatore') in 'Geometria' at the Dipartimento di Matematica 'E. De Giorgi' of the Università di Lecce from 1/5/1998 to 19/12/2003.
2003-2008	Associate professor in 'Geometria' at the Dipartimento di Matematica 'E. De Giorgi' of the Università del Salento (formerly known as Università di Lecce) from 20/12/2003;
2008-present	Associate professor in 'Fisica Matematica' at the Dipartimento di Matematica 'E. De Giorgi' (since 2012 Dipartimento di Matematica e Fisica 'E. De Giorgi') of the Università del Salento.

AFFILIATIONS

1994-2001	Member of the section Gruppo Nazionale di Fisica Matematica of the Istituto Nazionale di Alta Matematica, `http://www.altamatematica.it/`.
2002-2008	Member of the section Gruppo Nazionale di Geometria Algebrica e Strutture Algebriche of the Istituto Nazionale di Alta Matematica, `http://www.altamatematica.it/`.
2008-today	Member of the section Gruppo Nazionale di Fisica Matematica of the Istituto Nazionale di Alta Matematica, `http://www.altamatematica.it/`.
2016-present	Associate member of the Istituto Nazionale di Fisica Nucleare, branch of Lecce, `http://www.infn.it/`.

Research activity

Research interests: geometric methods in mathematical physics

- **Integrable systems**: Hamiltonian formalism for PDEs [22a, 25a, 26a, 13c, 29a, 33a, 34a, 37a, 38a, 40a], differential equations which are uniquely characterized by their symmetry group [16a, 17a, 9c, 10c, 11c, 15c, 30a], generalized symmetries and applications [32a, 35a, 36a]. I contribute to the contents of the website `http://gdeq.org/`, which is a community of researchers who are interested in geometry and differential equations. I developed software for the research of integrability operators (Hamiltonian, symplectic and recursion operators) [1f, 2f]. Together with A.C. Norman I wrote a technical manual on REDUCE internals and programming [3f].

- **Classical and quantum mechanics**: spherically symmetric solutions in Galilei relativity [2a], existence and classification of quantizations [4a, 7a, 3c], covariant symmetries in mechanics [2c, 8a, 15a, 28a], classical and quantum mechanics of the rigid body [18a, 19a, 5c], covariant quantization and geometric quantization [6c, 31a, 39a]. I recently published a paper of historical interest on an early contribution of Levi-Civita to the correspondence between symmetries and conserved quantities [27a].

- **Geometry of calculus of variations**: I have studied variational sequences, on which I published a chapter of the *Handbook of Global Analysis* [2b]. These are exact sequences of spaces of differential forms on jets where one of the morphisms of the sequence is the Euler–Lagrange operator. In particular I devoted myself to variational sequences of finite order [3a, 5a, 6a, 9a, 10a, 11a, 12a, 13a, 14a, 15a, 20a, 1c, 4c, 7c, 12c, Ph.D. Thesis] and to variational multivectors, which are duals to forms in the variational sequence [8c, 22a, 13c, 29a].

- **Classical field theory**: covariant Lagrangians for Einstein-Yang-Mills equations [1a, 1b], inverse problem for Yang–Mills equations [21a].

Schools

2000	Organizer of the 'IV Diffiety School' (directed by A.M. Vinogradov, Un. Salerno), on the geometry of PDE, Forino (AV, Italy), `http://diffiety.ac.ru`;
2005	I organized the school *Introduction to variational sequences* (lecturer D. Krupka, Un. of Olomouc, Czech Rep.) at the 'Centro E. De Giorgi', Lizzanello (Lecce, Italy), under the auspices of the Centro di ricerche matematiche 'E. De Giorgi', `http://www.crm.sns.it/`, from 5 to 9 April 2005.
2006	'Summer School in Global Analysis', organized by D. Krupka (Un. Olomouc, Czech Rep.) and J. Brajerčik (Un. of Prešov, Slovak Rep.) from 30 July to

5 August 2006 in Spišska Stara Ves (Slovak Rep.), Satellite conference of the ICM conference of Madrid (2006). I delivered a course on "Variational sequences on jets of submanifolds".

2012	"The first Summer School on the Geometry of Differential Equations", organized by the Institute of Mathematics of Silesian University in Opava, Czech Republic (17–21 September 2012). I delivered a course on "Symmetries of Partial Differential Equations".
2013	"The second Summer School on the Geometry of Differential Equations", organized by the Institute of Mathematics of Silesian University in Opava, Czech Republic (09–14 September 2013). I delivered a course on "Conservation laws of Partial Differential Equations".

VISITING OTHER UNIVERSITIES

Nov 1994	Un. of Salamanca, Spain
Feb 1995	Silesian University in Opava, Czech Rep. (I delivered a seminar);
Apr 1997	Silesian University in Opava, Czech Rep. (I delivered a seminar)
Apr 1997	Masaryk University of Brno, Czech Rep.(I delivered a seminar)
Feb 2000	Independent University of Moscow `http://ium.mccme.ru/english/`
Apr 2001	Independent University of Moscow (I delivered a seminar)
Jun 2002	University of Twente, NL
Apr 2003	Independent University of Moscow
Apr 2004	Un. Roma "La Sapienza" (I delivered a seminar)
Apr 2007	Independent University of Moscow
Nov 2007	University of Olomouc (Czech Rep.)
Feb 2008	Independent University of Moscow (I delivered a seminar)
May 2008	Independent University of Moscow (I delivered a seminar)
Jul 2008	Un. of Salamanca, Spain
Nov 2008	Masaryk University of Brno, Czech Rep. (I delivered a seminar)
Mar 2009	Independent University of Moscow (I delivered a seminar)
Sep 2009	University of Salamanca, Spain

Dec 2009   Independent University of Moscow (I delivered a seminar)

Lug 2010   University of Salamanca, Spain

Gen 2011   Independent University of Moscow

Apr 2011   Independent University of Moscow (I delivered a seminar)

Oct 2011   Università di Perugia

Nov 2011   Independent University of Moscow (I delivered a seminar)

Apr 2012   Independent University of Moscow

Sep 2012   Silesian Un. of Opava (Czech Rep.)

Mar 2013   SISSA, Trieste, Italy (I delivered a seminar).

Jul 2013   Rome, Italy (I delivered a seminar).

Sep 2013 – Jan 2014 I spent the semester at the Loughborough University, UK, where I cooperated with Prof. E. V. Ferapontov. I delivered two seminars at the Department of Mathematics.

Nov 2013   University of Leeds (I delivered a seminar).

Jan 2014   Imperial College (London, UK) (I delivered a seminar).

Feb 2014   Independent University of Moscow.

Jul 2014   Loughborough University.

Dec 2014   Silesian Univ. in Opava, Czech Rep. (I delivered a seminar).

Feb 2015   SISSA, Trieste, Italy (ho tenuto un seminario).

Feb 2015   Moscow, Russia. Ho tenuto un seminario presso il gruppo di ricerca di S.P. Novikov e V.I. Buchstaber, all'Università Statale di Mosca "Lomonosov", e un seminario presso l'Università Indipendente di Mosca .

Mar 2015   Università di Roma 'La Sapienza'.

Mag 2015   Loughborough University.

Jul 2015   Universidad de Salamanca (I delivered a seminar).

Nov 2015   Loughborough University and University of Leeds (I delivered a seminar). Invited by Prof. E.V. Ferapontov by a grant of the London Mathematical Society.

Mag 2016	Università di Milano Bicocca.
Lug 2016	University of Leeds.
Dic 2016	Independent University of Moscow (I delivered a seminar).
Feb 2017	Università di Perugia.
Feb 2017	Independent University of Moscow (I delivered a seminar).
1998-today	many short stays and seminars in the universities of Florence, Turin, Messina.

Conferences as a speaker

1995	Diff. Geom. and its Appl. VI, Brno
1996	Diff. Geom., Budapest
1996	XII Italian Conf. on Gen. Rel. and Grav. Phys., Rome
1997	New Ital. Contributions to Diff. Geom, Bari 1997
1998	(invited speaker) Diff. Geom. and its Appl. VII, Brno
1998	XIII Italian Conf. on Gen. Rel. and Grav. Phys., Bari
1999	(invited speaker) Multisymplectic Field Theory and its Appl., Salamanca
2001	(invited speaker) Diff. Geom. and its Appl. VIII, Opava, Czech Rep.
2002	(also as an organizer) Current Geometry, Napoli
2002	(also as an organizer) Simmetrie ed Equazioni Differenziali: aspetti teorici ed applicativi, Lecce (Italy) 5-7 February 2004.
2004	(invited speaker) Diff. Geom. and its Appl. IX, Praga 2004.
2006	(invited speaker) Workshop on Geometry and Symmetry of Differential Equations, S. Marinella (Roma), 2006.
2007	(invited speaker) Diff. Geom. and its Appl. X, Olomouc (Czech Rep.) 2007 `http://dga2007.upol.cz/`.
2008	(invited speaker) Abel Symposium, Tromso (Norway) 2008 `http://abelsymposium.no/2008`.
2010	(invited speaker) Geometry and Symmetry of Differential Equations, S. Marinella (Roma), 2010.

2010	Nonlinear Physics VI, Gallipoli 2010.
2010	(invited speaker) Workshop on Geometry of Differential Equations and Integrability, October 2010 `http://gdeq.org/Workshop_on_Geometry_of_Differential_Equations_and_Integrability`.
2011	(also as an organizer) Waves and Stability in Continuous Media, Brindisi 2011 `http://wascom.matematica.unisalento.it`
2012	(invited speaker) Assemblea Scientifica GNFM 2012 Montecatini Terme, 4-6 Ottobre 2012 (see `http://www.altamatematica.it/gnfm/node/20`)
2013	(also as an organizer) "Geometry and Quantum Theories" in honour of L. Mangiarotti and M. Modugno, Florence 10–11 June 2013 (see `http://www.dma.unifi.it/~meeting_june_2013/home/home.html`)
2014	(invited speaker) Symmetry and perturbation Theory, Cala Gonone (Italy), giugno 2014, `http://www.sptspt.it/`.
2014	(invited speaker) Workshop on Integrable Systems, Milano Bicocca, June 2014. `http://www.matapp.unimib.it/~lorenzoni/Workshop/`.
2015	(invited speaker) Mini-Workshop on Integrable Equations, Independent University of Moscow, Moscow, Russia, February 2015 `http://gdeq.org/Mini-Workshop_on_Integrable_Equations`
2015	(also as an organizer) Workshop on Integrable Nonlinear Equations, Mikulov (Czech Republic), October 2015 `http://gdeq.org/Workshop_on_Integrable_Nonlinear_Equations`
2016	(invited speaker) London Mathematical Society – EPSRC Durham Symposium: Geometric and Algebraic aspects of Integrability, `http://www.maths.dur.ac.uk/lms/105/index.html`, 25 July – 3 August 2016, Durham Univ., UK.
2017	(invited speaker) Dynamics in Siberia, 26 February – 4 March 2017, Sobolev Mathematical Institute, Akademgorodok – Novosibirsk (Russia). `http://www.math.nsc.ru/conference/ds/2017/index.html`
2017	Scientific Gruppo Nazionale di Fisica Matematica, Montecatini, 4–6 maggio 2017. `http://www.altamatematica.it/gnfm/it/node/20`

CONFERENCES AS AN ORGANIZER

2000-2003	I participated to the organization of the series of four conferences *Current Geometry* (under the supervision of A.M. Vinogradov, Un. Salerno,

and in cooperation with 'Istituto Italiano per gli Studi Filosofici, GNSAGA of the Istituto Nazionale di Alta Matematica, Università di Napoli), see `http://diffiety.ac.ru` for details.

2004	I organized the meeting *Simmetrie ed Equazioni Differenziali: aspetti teorici ed applicativi* in Lecce (Italy) from 5 to 7 February 2004.
2007	I was the local organizer of the VI conference *Symmetry and perturbation theory*, Otranto 2–9 June 2007; see `http://www.sptspt.it/`.
2011	I was the local organizer of the VII conferece *Symmetry and perturbation theory*, held in Otranto from 5 to 12 June 2011, see `http://www.sptspt.it/`.
2011	I was the chairman of the local organizing committee of the XVI conference *Waves and Stability in Continuous Media*, held in Brindisi from 12 to 18 June 2011 `http://wascom.matematica.unisalento.it/`.
2013	I was one of the organizers of the meeting "Geometry and Quantum Theories" in honour of L. Mangiarotti and M. Modugno, Florence 10–11 June 2013 (see `http://www.dma.unifi.it/~meeting_june_2013/home/home.html`)
2013	I was one of the organizers of the conference "Physics and Mathematics of Nonlinear Phenomena", held in Gallipoli (Italy) 22–29/07/2013.
2015	I was one of the organizers of the conference "Physics and Mathematics of Nonlinear Phenomena", held in Gallipoli (Italy) Gallipoli, 20–27 June 2015 `http://pmnp.unisalento.it`
2015	I was one of the organizers of the conference Workshop on Integrable Nonlinear Equations, Mikulov (Czech Republic), October 2015 `http://gdeq.org/Workshop_on_Integrable_Nonlinear_Equations`
2017	I am one of the organizers of the conference Physics and Mathematics of Nonlinear Phenomena: 50 years of Inverse Scattering Transform, Gallipoli, 17–24 giugno 2017 `http://pmnp.unisalento.it`

Research advisor

2003-2008	Dr. G. Manno, with a degree in Mathematics at the Università di Napoli 'Federico II' and Ph.D. at King's College, was a De Giorgi Fellow and has been a Research Fellow, both under my supervision.
2009–2010	Tutor of the Ph.D. student R. De Pascalis, Ph.D. in Mathematics, Università del Salento.

| 2009–2011 | Tutor of a Research Fellow in Fisica Matematica, Dott. Luigi Vergori, Dipartimento di Matematica, Università del Salento. |

EDITORIAL ACTIVITY.

I have been a referee for the following journals: Acta Applicandae Mathematicae, Archivum Mathematicum (Brno), Central European Journal of Mathematics, Czechoslovak Mathematical Journal, Demonstratio Mathematica, Differential Geometry and its Applications, Classical and Quantum Gravity, European Journal of Physics, International Journal of Geometric Methods in Modern Physics, International Journal of Non-Linear Mechanics, Journal of Geometry and Physics, Journal of Mathematical Physics, Journal of Nonlinear Mathematical Physics, Journal of Physics A: math. theor., Mathematical Proceedings of the Cambridge Philosophical Society, Nonlinear Analysis Series A: Theory, Methods & Applications, Note di Matematica, Physics Letters A, Proceedings of the Royal Society A, Proceedings of the Royal Society of Edinburgh, Real Academia de Ciencias (Spagna), Reports on Mathematical Physics, SIGMA.

I have been a reviewer for MathSciNet (AMS) and Zentralblatt (EMS).

GRANTS

FUNDED RESEARCH PROJECTS

1998-today	My research activity was continuously supported mostly by the Dipartimento di Matematica of the Università del Salento.
1999	Grant from GNFM for a one-month visiting professor (A.M. Verbovetsky, Indep. Un. Moscow)
1999	Progetto Giovani Ricercatori (grant issued at a national level with calls in all state universities), Prot. 326/UPSG/99 Università di Lecce.
2001	*Formalismo hamiltoniano in teoria dei campi*, national call issued by GNFM, I was the responsible (the project involved 4 researchers).
2003-2005	*Sistemi integrabili, teorie classiche e quantistiche*, PRIN03, member (Progetto di Ricerca di Interesse Nazionale, see `http://prin.miur.it`)
2005	Grant from GNSAGA of INdAM (see `http://www.altamatematica.it`) for a one-month visiting professor (A.M. Verbovetsky, Indep. Un. Moscow)
2005-2007	*Simmetrie e Supersimmetrie Classiche e Quantistiche* PRIN05, member (Progetto di Ricerca di Interesse Nazionale, see `http://prin.miur.it`)
2007	Grant from GNSAGA of INdAM (see `http://www.altamatematica.it`) for a one-month visiting professor (J. Pohjanpelto, Oregon State Un.)

2007-2008	Russian Foundation for Basic Research - EINSTEIN Consortium project "Hamiltonian formalism for nonlinear differential equations and nonlocal aspects of integrability", I was the team leader on the Italian side.
2008	Responsabile Scientifico for the Università del Salento of the Progetto Sud-Est, PON Ricerca scientifica, sviluppo tecnologico, alta formazione 2000-2006 Asse III - Sviluppo del capitale umano di eccellenza Misura III.5 - Adeguamento del sistema della formazione professionale, dell'istruzione e dell'alta formazione - Azione Orientamento, Avviso n. 2269/2005, Linea di intervento b. I administrated a budget of 400.000EUR.
2009-2010	Russian Foundation for Basic Research - EINSTEIN Consortium project "Development and application of homological methods in the theory of integrable systems", I was the team leader on the Italian side.
2010	GNFM: stay at the Department of Mathematics, University of Salamanca (10 days).
2010	GNFM: visiting professor, 8 days (J. Janyska, Masaryk University, Brno, Czech Republic).
2011	GNFM: visiting professor, 15 days (J. Krasil'shchik, Independent University of Moscow).
2011	VII conference SPT - 5000EUR grant from Università del Salento through funds from Monte dei Paschi di Siena, and 2500EUR grant from GNFM.
2011	XVI conference WASCOM - 15000EUR grant from Facoltà di Ingegneria Industriale (sede di Brindisi), Università del Salento, and 5000EUR grant from Università del Salento through funds from Monte dei Paschi di Siena.
2012	Conference "Physics and Mathematics of Nonlinear Phenomena", see `http://pmnp2013.dmf.unisalento.it/`, 5000EUR grant from Università del Salento and 3000EUR from the Dipartimento di Matematica e Fisica of the Università del Salento.
2013–2015	PRIN MIUR 2010-2011 (see `http://prin.miur.it/`) "Teorie geometriche e analitiche dei sistemi Hamiltoniani in dimensioni finite e infinite", Scientific Head: B.A. Dubrovin, I'm a member of the Unit in the Università del Salento, headed by B.G. Konopelchenko.
2013	GNFM: visiting professor M.V. Pavlov, Lebedev Inst. of Theoretical Physics (Moscow), 30 days 2500EUR (invitation shared with Prof. N. Manganaro, Un. Messina).
2014	GNFM: visiting professor M.V. Pavlov, Lebedev Inst. of Theoretical Physics (Moscow), 15 days 1500EUR.

2015	GNFM: visiting professor E.V. Ferapontov, Loughborough University (UK), 15 days 2000EUR.
2015	London Mathematical Society Visitors Grant (Scheme 2), 970£. Visit to Loughborough (prof. E.V. Ferapontov), Leeds (prof. A. Fordy), November 2015.
2016	GNFM: contribution of 300EUR for travel expenses for the academic visit at the University of Leeds (Prof. A. Fordy) and the participation as an invited speaker to the conference London Mathematical Society – EPSRC Durham Symposium: Geometric and Algebraic aspects of Integrability, `http://www.maths.dur.ac.uk/lms/105/index.html`, 25 July – 3 August 2016, Durham Univ., UK.

REFEREEING GRANT PROPOSALS

2010-present	Referee for research projects of young researchers in different Universities in the European Union.
2015	Referee for the Scientific Independence of young Researchers grant of the Italian Ministero dell'Istruzione, Università e Ricerca.

TEACHING ACTIVITY

COURSES (AS A TEACHER)

2000-2001	Temporary teacher in Geometry and Algebra, Information Engineering, Un. Lecce
2002-2003	Temporary teacher in Geometry and Algebra, Management Engineering, Un. Lecce
2004-2005	Course of **Matrix Computations**, Master in Automation, Communication, Information engineering Un. Lecce
2004-2008	Courses of **Geometry and Algebra**, Batchelor in Information Engineering Un. Lecce
2006-2013	Courses of **Geometry and Algebra**, Batchelor in Management and Industrial Engineering Un. Lecce
2006-2008	Course of **Numerical Analysis**, Master in Aerospace Engineering Un. Lecce
2006-2008	Courses of **Laboratory of Numerical Analysis**, Master in Aerospace Engineering Un. Lecce

2007-present	Course of **Mathematical Methods for Aerospace Engineering with Laboratory**, Master in Aerospace Engineering Un. Lecce
2013-2014	Course **Mathematical Physics**, Batchelor in Mathematics, Un. Salento.
2014-2015	Course **Rational Mechanics**, Batchelor in Civil Engineering, Un. Salento.
2014-present	Course **Rational Mechanics**, Batchelor in Industrial Engineering, Un. Salento.
2016-present	Course **Mathematical Physics**, Master in Mathematics, Un. Salento.

Courses (as an assistant teacher)

1996-1997	Electronic Engineering Un. Firenze (course: 'Geometria')
1998-1999	Information Engineering and Materials Engineering Un. Lecce (course 'Geometria ed Algebra' like the next ones)
1999-2005	Information Engineering and Materials Engineering Un. Lecce

Other courses

2002-2009	I delivered the course *Laboratory for multimedia in teaching mathematics* (20 hours on LaTeX, Octave, Maxima) for which I developed course notes (see above) at the Dipartimento di Matematica of the Università di Lecce for the State School for the Qualification of High School Teachers; 20 hours in each academic year.
2007-2008	I delivered the course *Innovative technologies for teaching/learning mathematics* at the State School for the Qualification of Teachers in High Schools in Bari (30 hours).
2013	I delivered a module "Matematica 2" within the Course ITS "Higher technician for production and maintenance of means of transport and their infrastructures" (25 hours).
2016	I delivered a module "Matematica 2" within the Course ITS "Higher technician for production and maintenance of means of transport and their infrastructures" (25 hours).

Course notes

2001	G. De Cecco, R. Vitolo: Note di Geometria ed Algebra, 110 pages, Università di Lecce

2001	G. Calvaruso, R. Vitolo: Esercizi di Geometria ed Algebra Lineare, 110 pages, Università di Lecce
2005	G. De Cecco, R. Vitolo: Note di Calcolo Matriciale, 160 pages, Università di Lecce
2006	R. Vitolo: Manuale di preparazione ai test di autovalutazione, 50 pages, Università di Lecce
2008	R. Vitolo: Introduzione a Octave
2008	R. Vitolo: Introduzione a Maxima
2012	R. Chirivì, R. Vitolo: Geometria ed Algebra, 105 pages, Università di Lecce
Note	The notes are all in Italian; they are available at my web page `http://poincare.unile.it/vitolo/`

Advisor of degree thesis, Un. Lecce – Salento

1999	M.G. Petrelli, 'Exterior algebra and direct sum', master degree in Mathematics.
2002	V. Cagnazzo, 'Geometry of jets of submanifolds and applications', master degree in Mathematics.
2003	A.B. Barone, 'Cohomology of manifolds through Mayer-Vietoris sequence', master degree in Mathematics.
2005	M.L. Colagiorgio (co-advisor), 'Symmetries of Ordinary Differential Equations', master degree in Mathematics.
2013	S. Quaranta, 'Geometria delle equazioni differenziali ed applicazioni' (co-advisor), master degree in Mathematics.
2010-present	Co-advisor of many degree thesis in Engineering.

PhD schools

2003	Ph.D. course of 30 hours at the Ph. D. in Mathematics, Univ. Lecce, about *Lie groups and symmetries of PDE*.
2005-2007	Member of the advisory board of Ph.D. in Information Engineering (Department of Innovation Engineering), Univ. Lecce.

2007-2013	Member of the advisory board of Ph.D. in Mathematics (Department of Mathematics), University of Salento.
2009	Member of the committee for the final exam, Ph.D. in Mathematics, Università di Torino.
2011	President of the committee for the final exam, Ph.D. in Mathematics, Università di Messina.
2012	Member of the committee for the final exam, Ph.D. in Mathematics, Università di Torino.
2015	Member of the committee for the admittance exam, Ph.D. in Mathematics, Univ. del Salento e della Basilicata.
2013-2017	Member of the advisory board of the Ph.D. in Mathematics (consortium between the Università del Salento and the Università degli Studi della Basilicata).

ADMINISTRATIVE ACTIVITY

2010 - 2012	Vicedirector of the Dipartimento di Matematica.
2010 - 2016	Member of the board of directors of the Centro Servizi Grandi Progetti, that manages all projects whose budget comes from external funds (EU, national, regional and private) of the Università del Salento.
2009 - 2011	Vicepresident of the Council of teachers at the Master degree in Aerospace Engineering, Università del Salento.
2004 - today	Responsible of typesetting of the journal *Note di Matematica*, edited by the Dipartimento di Matematica of the Università del Salento `http://siba-ese.unile.it/index.php/notemat`.
2016 - today	Vicedirector of the Dipartimento di Matematica e Fisica, Un. Salento.

MISCELLANEA

INTERESTS IN COMPUTER SCIENCE

LaTeX	I have a good knowledge of TeX/LaTeX. I was (up to 2014) in the editorial board of the italian journal of TeX/LaTeX, ArsTeXnica, published by the Gruppo Utenti Italiani TeX/LaTeX(GUIT). I wrote the style files for 'Note di Matematica', a mathematical journal published by the Dipartimento di Matematica, Università del Salento, see `http://siba2.unile.it/notemat`.

Linux	I'm interested in Linux and Free Software, I am a member of SaLUG!, the Salento GNU/Linux Users Group (`http://salug.it`).
Reduce	I am one of the developers and the maintainer of CDIFF and CDE, RE-DUCE packages for the research of integrability structure for differential equations, `http://gdeq.org/Category:Software`. REDUCE is a LISP-based Computer Algebra System developed since the Sixties, now free software, see `http://reduce-algebra.sourceforge.net/`.

Language abilities

Italian	mother tongue.
English	level C1 self-assessed. I worked for 6 months in UK and I delivered several seminars in UK universities.
Spanish	level B2 self-assessed. I worked for some months alltogether in Spain, mostly in Salamanca, where I also delivered seminars in Spanish.
French	I have a good understanding of written texts, and I have basic abilities of conversation.

Popularization of science

I wrote the paper [1e] for the philosophy journal of the Università del Salento, where I described the problem of finding the tolopogy of the universe.

In cooperation with F. Paparella I wrote the paper [2e] on numerical computations with Octave, which is a Matlab emulator. This paper comes from our teaching experience of using the program in courses for engineers or applied mathematicians.

Lecce, December 20, 2017

Raffaele Vitolo

Publications by R. Vitolo

Papers on journals

[1a] G. Giachetta, M. Mangiarotti, R. Vitolo: *The Einstein-Yang-Mills equations*, J. Gen. Rel. Grav. **23**, n. 1 (1991) 641–659.

[2a] R. Vitolo: *Spherical symmetry in classical and quantum Galilei general relativity*, Ann. Inst. 'H. Poinc.', **64**, n. 2 (1996) 177–203.

[3a] R. Vitolo: *A new infinite order formulation of variational sequences*, Arch. Math. Un. Brunensis, **34**, n. 4 (1998), 483–504; EMS server `http://www.emis.de`.

[4a] R. Vitolo: *Quantum structures in Galilei general relativity*, Ann. Inst. 'H. Poincaré' **70**, n. 3 (1999) 239–258.

[5a] R. Vitolo: *Finite order variational bicomplexes*, Math. Proc. of the Camb. Phil. Soc., **125**, n. 2 (1999) 321-333; `http://arXiv.org`, math-ph/0001009.

[6a] R. Vitolo: *On different geometric formulations of Lagrangian formalism*, Diff. Geom. and its Appl., **10**, n. 3 (1999), 225–255.

[7a] R. Vitolo: *Quantum structures in Einstein general relativity*, Lett. Math. Phys. **51** (2000), 119–133.

[8a] D. Saller, R. Vitolo: *Symmetries in covariant classical mechanics*, J. Math. Phys. **41**, n. 10, October 2000, 6824–6842, `http://arXiv.org`, math-ph/0003027.

[9a] M. Palese, R. Vitolo: *On a class of polynomial Lagrangians*, Proc. of the winter school 'Geometry and Physics', Srni (Czech Rep) 2000, Rend. Mat. Palermo Serie II, Suppl. 66 (2001), 147–159, `http://arXiv.org`, math-ph/0111019.

[10a] M. Francaviglia, M. Palese, R. Vitolo: *Symmetries in finite order variational sequences*, Czech. Math. J. **52** (127) (2002), 197–213.

[11a] R. Vitolo: *Finite order formulation of Vinogradov C–spectral sequence*, Acta Appl. Math. **70** 1-2, (2002) 133–154.

[12a] I. Kolar, R. Vitolo: *On the Helmholtz operator for Euler morphism*, Math. Proc. Camb. Phil. Soc. **135** (2003), 277–290.

[13a] G. Saccomandi, R. Vitolo: *Null Lagrangians for nematic elastomers*, Fundamental'naya i Prikladnaya Matematika 10 (2004) n.1 "Geometry of integrable models", A. V. Kiselev (ed.) (Russian); English translation in Journal of Mathematical Sciences 136, n. 6 (2006), 4470-4477.

[14a] M. Francaviglia, M. Palese, R. Vitolo: *A geometric formulation of Hessian and Jacobi tensors for higher order Lagrangians*, Differential Geometry and its Applications **22**, n. 1 (2005), 105–120.

[15a] G. Manno, R. Vitolo: *Relativistic mechanics, contact manifolds and symmetries*, Note di Matematica **23**, n. 2 (2004/2005), 157–171.

[16a] G. Manno, F. Oliveri, R. Vitolo: *On differential equations determined by the group of point symmetries*, J. Math. Anal. Appl. **332** (2007), 767–786.

[17a] G. Manno, F. Oliveri, R. Vitolo: *On differential equations determined by the group of point symmetries*, Theoret. Math. Phys. **151** n. 3 (2007), 843–850.

[18a] M. Modugno, R. Vitolo: *The geometry of Newton's law and rigid systems*, to appear in Archivum Math. Univ. Brunensis **43**, n. 2 (2007); see also `http://arxiv.org/abs/math-ph/0511019`.

[19a] M. Modugno, C. Tejero Prieto, R. Vitolo: *A covariant approach to the quantisation of a rigid body*, J. Phys. A: Math. theor. **41** (2008) 035304.

[20a] G. Manno, R. Vitolo: *Geometric aspects of higher order variational principles on submanifolds*, Acta Appl. Math. **101** 1-3 (2008), 215–229.

[21a] G. Manno, J. Pohjanpelto, R. Vitolo: *Symmetries, conservation laws and variational principles for gauge theories*, J. Geom. Phys. **58** (2008), 996–1006.

[22a] P. Kersten, I.S. Krasil'shchik, A.M. Verbovetsky, R. Vitolo: *Integrability of Kupershmidt's deformation*, Acta Appl. Math. **109** no. 1 (2010), 75–86.

[23a] J. Janyška, M. Modugno, R. Vitolo: *An algebraic approach to physical scales*, Acta Appl. Math. **110**, no. 3 (2010), 1249–1276.

[24a] I. Kolář, R. Vitolo: *Absolute contact differentiation on submanifolds of Cartan spaces*, Differential Geometry and its Applications **28**, Issue 1 (2010), 19–32.

[25a] P. Kersten, I.S. Krasil'shchik, A.M. Verbovetsky, R. Vitolo: *On integrable structures for a generalized Monge-Ampere equation*, Theor. Math. Phys. 128, no. 2 (2012), 600-615.

[26a] I.S. Krasil'shchik, A.M. Verbovetsky, R. Vitolo: *A unified approach to computation of integrable structures*, Acta Appl. Math. 120, no. 1 (2012), 199-218.

[27a] G. Saccomandi, R. Vitolo: A Translation of the T. Levi-Civita paper: *Interpretazione Gruppale degli Integrali di un Sistema Canonico*, Rend. Acc. Lincei, s. 3^a, vol. VII, 2° sem. 1899, pp. 235–238, Regular and Chaotic Dynamics, Volume 17, Issue 1, pp. 105-112 (2012).

[28a] J. JANYSKA, R. VITOLO: *On the characterization of infinitesimal symmetries of the relativistic phase space*, J. Phys. A: Math. Theor. **45** (2012) 485205 (28pp).

[29a] E.V. FERAPONTOV, M.V. PAVLOV, R.F. VITOLO: *Projective-geometric aspects of homogeneous third-order Hamiltonian operators*, J. Geom. Phys., **85** (2014), 16–18.

[30a] G. MANNO, F. OLIVERI, G. SACCOMANDI, R. VITOLO: *Ordinary differential equations described by their Lie symmetry algebra*, J. Geom. Phys., **85** (2014), 2–15.

[31a] C. TEJERO PRIETO, R. VITOLO: *On the geometry of the energy operator in quantum mechanics*, International Journal of Geometric Methods in Modern Physics, Vol. 11, No. 07 (2014): 1460027.

[32a] G. SACCOMANDI, R. VITOLO: *On the Mathematical and Geometrical Structure of the Determining Equations for Shear Waves in Nonlinear Isotropic Incompressible Elastodynamics*, J. Math. Phys. **55** (2014), 081502.

[33a] M.V. PAVLOV, R.F. VITOLO: *On the Bi-Hamiltonian geometry of WDVV equations*, Lett. Math. Phys. (2015) 105:1135-1163.

[34a] E.V. FERAPONTOV, M.V. PAVLOV, R.F. VITOLO *Towards the classification of homogeneous third-order Hamiltonian operators*, Int. Math. Res. Notices **22** (2016), 6829–6855, `doi:10.1093/imrn/rnv369` `http://arxiv.org/abs/1508.02752`.

[35a] E. PUCCI, G. SACCOMANDI, R. VITOLO: *Bogus Transformations in Mechanics of Continua*, Int. J. of Engineering Sciences, **99** (2016), 13–21.

[36a] A. SERGYEYEV, R. VITOLO: *Symmetries and conservation laws for the Karczewska–Rozmej–Rutkowski–Infeld equation*, Nonlinear Analysis: Real World Applications **32** (2016), 1–9; `http://arxiv.org/abs/1511.03975`

[37a] M.V. PAVLOV, R.F. VITOLO: *Remarks on the Lagrangian representation of bi-Hamiltonian equations*, J. Geom. Phys. **113C** (2017), 239–249. DOI: `http://dx.doi.org/10.1016/j.geomphys.2016.10.013`, arXiv: `https://arxiv.org/abs/1610.01817`.

[38a] P. LORENZONI, A. SAVOLDI, R. VITOLO: *Bi-Hamiltonian structures of KdV-type*, J. Phys. A: Math. Theor, **51** no. 4 (2018), 045202. `http://arxiv.org/abs/1607.07020`.

[39a] C. TEJERO PRIETO, R. VITOLO: *The geometry of real reducible polarizations in quantum mechanics*, J. Phys. A: Theor. Math. **50** no. 10 (2017), 105205. `http://arxiv.org/abs/1608.00031`

[40a] E.V. FERAPONTOV, M.V. PAVLOV, R.F. VITOLO: *Systems of conservation laws with third-order Hamiltonian structures*, submitted (2017) `https://arxiv.org/abs/1703.06173`

Books and parts of books

[1b] G. Giachetta, M. Mangiarotti, R. Vitolo: *Some results on the Einstein-Yang-Mills equations*, in 'Modern Problems in Theoretical Physics', ed. O. Obukhov, P. Pronin, World Scient., Singapore 1991.

[2b] R. Vitolo: *Variational sequences*, section of the book 'Handbook of Global Analysis', edited by D. Krupka e D. Saunders, will appear in the end of 2006, publ. by Elsevier.

[3b] J. Krasil'shchik, A. Verbovetsky, R. Vitolo: The symbolic computation of intrgrability structures for partial differential equations, Texts and monographs on Symbolic Computation, Springer, to appear (2017).

Conference proceedings

[1c] R. Vitolo: *Some aspects of first-order variational sequences in mechanics*, Proc. of the VI Conf. in Diff. Geom. and its Appl., Brno 1995, 487–494; EMS server `http://www.emis.de`.

[2c] M. Modugno, R. Vitolo: *Quantum Connection and Poincaré-Cartan form*, Proc. of the conference in honour of A. Lichnerowicz, Frascati, october 1995; ed. G. Ferrarese, Pitagora, Bologna 1996.

[3c] R. Vitolo: *Quantum structures in general relativistic theories*, Proc. of the XII National. Conf. of Gen. Rel. and Grav. Phys., Roma (1996) 375-359, World Scientific.

[4c] M. Francaviglia, M. Palese, R. Vitolo: *Superpotentials in variational sequences*, Proc. of the VII Conf. on Diff. Geom and Appl., Brno 1998, 469-480; EMS server `http://www.emis.de`.

[5c] R. Vitolo: *Quantising the rigid body*, Proc. of the VII Conf. on Diff. Geom and Appl., Brno 1998, 155-175; EMS server `http://www.emis.de`.

[6c] M. Modugno, C. Tejero Prieto, R. Vitolo: *Comparison between Geometric Quantisation and Covariant Quantum Mechanics*, Proceedings of Lie Theory and Its Applications in Physics III (World Scientific, 2000), edited by H.-D. Doebner, V.K. Dobrev and J. Hilgert, 155–175; `http://arXiv.org`, math-ph/0003029.

[7c] G. Manno, R. Vitolo: *Variational sequences on finite order jets of submanifolds*, Proc. of the VIII int. conf on Diff. Geom. and its Appl., Opava (Czech Rep.), 2001, 435–446.

[8c] S. Igonin, A. Verbovetsky, R. Vitolo: *Variational Multivectors and Brackets in the Geometry of Jet Spaces*, V Int. Conf. on on Symmetry in Nonlinear Mathematical Physics, Kyiv 2003; Part 3 of Volume 50 of Proceedings of Institute of

Mathematics of NAS of Ukraine, Editors A.G. Nikitin, V.M. Boyko, R.O. Popovych and I.A. Yehorchenko (2004), 1335–1342; `http://www.imath.kiev.ua/~snmp2003/Proceedings/vitolo.pdf`.

[9c] F. Oliveri, G. Manno, R. Vitolo: *On an Inverse Problem in Group Analysis of PDE's: Lie–Remarkable Equations*, "Proceedings XIII International Conferenc on Waves and Stability in Continuous Media", World Scientific Co., Singapore, 2006.

[10c] F. Oliveri, G. Manno, R. Vitolo: *Lie Remarkable PDEs*, in "Asymptotic methods in nonlinear wave phenomena", in honour of the 65th birthday of Antonio Greco, World Scientific Co., Singapore, 2007.

[11c] F. Oliveri, G. Manno, R. Vitolo: *On the correspondence between differential equations and symmetry algebras*, Symmetry and Perturbation Theory, proceedings of the conference in Otranto, 2/6–9/6/2007, World Scientific 2007.

[12c] R. Vitolo: *Finite order variational sequences: a short review*, Proceedings of the conference in honour of D. Krupka, Nova Science Publisher 2008 (Olomouc, Czech Rep.), 117–136.

[13c] P.H.M. Kersten, I.S. Krasil'shchik, A.M. Verbovetsky, R. Vitolo: *Hamiltonian structures for general PDEs*, Proceedings of the 2008 Abel Symposium, Tromso (Norway) 17–22 June 2008, Springer (to appear).

[14c] M. Modugno, C. Tejero Prieto, R. Vitolo: *Geometric aspects of the quantization of a rigid body*, Proceedings of the 2008 Abel Symposium, Tromso (Norway) 17–22 June 2008, Springer (to appear).

[15c] F. Oliveri, G. Manno, R. Vitolo: *Differential equations and Lie symmetries*, "Wascom 2007"–14th Conference on Waves and Stability in Continuous Media, World Scientific Publishing, River Edge, NJ, 459–468.

Ph. D. Thesis

[Ph.D. Thesis] R. Vitolo: Bicomplessi lagrangiani ed applicazioni alla meccanica classica e quantistica, Ph.D. thesis, Firenze 1996.

Editiorial activity

[1e] L. Martina, G. Saccomandi, R. Vitolo: Simmetrie ed equazioni differenziali: aspetti teorici ed applicativi - Liguori publ. ('Note di Matematica', **23** n. 2 (2004/2005)).

[2e] G. Gaeta, R. Vitolo, S. Walcher: Symmetry and Perturbation Theory, proceedings of the conference, Otranto (Italy) 2/6–9/6/2007, World Scientific (2008).

[3e] S. Rionero, T. Ruggeri, G. Saccomandi, R. Vitolo: Special volume of Note di Matematica in occasion of the XVI conference Waves and Stability in Continuous Media, Brindisi (Italy), 12/6–18/6/2011. Vol. **32** n. 1 (2012).

[4e] S. Rionero, T. Ruggeri, G. Saccomandi, R. Vitolo Special volume of Acta Applicandae Mathematicae in occasion of the XVI conference Waves and Stability in Continuous Media, Brindisi (Italy), 12/6–18/6/2011. Vol. **122** n. 1 (2012).

[5e] B. Konopelchenko, G. Landolfi, L. Martina, R. Vitolo, Physics and Mathematics of Nonlinear Phenomena 2013 (PMNP2013) 22-29 June 2013, Gallipoli, Italy. Journal of Physics: Conference Series **482**, IOP Publishing 2014 (47 papers) `http://iopscience.iop.org/1742-6596/482/1`.

Software

[1f] R. Vitolo: *CDIFF: a REDUCE package for computations in geometry of differential equations*, a user guide to computations in geometry of differential equations. Software developed by P. Gragert, P. Kersten, G. Post, G. Roelofs, University of Twente, The Netherlands, freely available at `http://gdeq.org/Category:Software`, 2010

[2f] R. Vitolo: *CDE: a REDUCE package for integrability of PDEs*, software, user guide and examples, freely available at `http://gdeq.org/Category:Software`, version 1.0 (2014), version 2.0 (2015).

[3f] A.C. Norman, R. Vitolo: *Inside REDUCE*, a guided tour to REDUCE internals for programmers. Included in the REDUCE distribution at Sourceforge: `http://sourceforge.net/projects/reduce-algebra/`

General publications

[1g] R. Vitolo: *La forma dell'Universo*, Idee (Journal of Philosophy of the University of Lecce, Milella publ.) **61** (2006), 53–59 (in Italian).

[2g] F. Paparella, R. Vitolo: *Analisi numerica con GNU Octave*, Linux & C. (Italian magazine on Linux and Free Software) **52** (2006), 44–49 (in Italian).

[3g] G. Saccomandi, R. Vitolo: *La mobilità accademica nella proposta di riforma*, paper on the news website `lavoce.info`, 25 November 2010, `http://www.lavoce.info/archives/26622/la-mobilita-accademica-nella-proposta-di-riforma/`

Lecce, December 20, 2017

Raffaele Vitolo