Raffaele Vitolo

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CV in brief

Education:
- Degree in Mathematics at the University of Camerino (1991)
- PhD in Mathematics at the University of Florence, 1996.

Career:
- Assistant professor at the Dipartimento di Matematica, Università di Lecce, from 1998 to 2003.
- Associate professor of Mathematical Physics at the Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, from 2003 to 2024.
- Italian habilitation to full professor of Mathematical Physics in 2017.
- Full professor of Mathematical Physics at the Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento since 2024.
- Member of the Istituto Nazionale di Alta Matematica (INdAM, Section of Mathematical Physics – GNFM) and of the Istituto Nazionale di Fisica Nucleare (INFN, Section of Lecce).

Research Interests: Geometric methods in partial differential equations, integrable systems, symbolic computations and Lisp programming, applied and industrial mathematics, numerical computations in Matlab.

Publications:
- more than 60 papers in refereed international high-level journals in Pure Mathematics, Applied Mathematics, Theoretical Physics (indexed in Scopus and Web of Science);
- more than 15 papers in conference proceedings; editor of 5 proceedings volumes;
- 2 book chapters;
- one research-level book published by Springer;
- referee for more than 40 international high-level journals on Pure and Applied Mathematics, Theoretical Physics, Engineering.

Collaborations:
- co-authorship of papers with researchers from Czech Republic, Germany, Italy, Netherlands, Russia, Spain, UK, USA;

- over 40 1-2 weeks visits for scientific colloquia and seminars in Universities in Europe and USA;
- one semester spent in UK at the Loughborough University (2013-2014);
- one semester spent in The Netherlands at the University of Amsterdam (2021-2022).

Patent: In the framework of a collaboration with the European Space Agency he is co-inventor of a patent.

Conferences: speaker at about 30 international conferences (invited in many of them) in Europe and Russia. Member of the organizing committee of about 15 international conferences.

Funding: Member of more than 20 funded research project. The budget that I administrated ranged from hundreds of Euros up to 420,000 Euros.

Teaching:
- Teaching since 1995 about 2-3 courses per year on basic Mathematics, Mathematical Physics, Applied Mathematics, mostly in the Università del Salento.
- Member of the advisory board of some PhD programmes at the Università del Salento.
- Organizer and teacher of several graduate schools on the geometry of partial differential equations.

Administration:
- Vice-director of the Department of Mathematics (2010–2012);
- member of the board of directors of the Centro Servizi Grandi Progetti (management of all projects of the Università del Salento, 2010–2016);
- Vice-director of the Department of Mathematics and Physics from March 2016 to March 2020.

Computer abilities:
- Linux user since 1998; good system administration abilities.
- Scientific-level abilities in Lisp programming for symbolic computations.
- Scientific-level abilities in Matlab and Octave for numerical analysis.
- High-level abilities in LaTeX for the digital typography of Mathematics.
- Good abilities in HTML and CSS for building simple web sites.
- Office programs (Word, Excel).

Languages:
- Italian: mother tongue.
- English: level C1 self-assessed.
- Spanish: level B2 self-assessed.
- French: basic speaking and good reading abilities.
- Russian: basic speaking and reading abilities.

For more detailed information, please look at the following pages.

Detailed information

Education

1990	Perugia Summer School (by Scuola Matematica Interuniversitaria http://www.matapp.unimib.it/smi/);
1991	Degree in Mathematics: Università di Camerino, 1991, 110/110 and 'Lode'.
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. Advisor: Prof. M. Modugno.
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;
2008-2024	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.

2017	Italian habilitation to full professor in Mathematical Physics, 5 positive judgements over 5; valid until 2027.
2024-today	Full professor in Mathematical Physics at the Department of Mathematics and Physics "E. De Giorgi" of the University of 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/.
2014-today	Director of the Research Unit of Istituto Nazionale di Alta Matematica at the Università del Salento.
2016-2020	Associate member of the Istituto Nazionale di Fisica Nucleare, branch of Lecce, http://www.infn.it/.
2020-today	Appointed researcher ('ricercatore incaricato') at the Istituto Nazionale di Fisica Nucleare, branch of Lecce, http://www.infn.it/.

Research activity

Research interests: geometric methods in mathematical physics

Note: the numbers in brackets refer to the list of publications at the end of this document.

- **Integrable systems**: Hamiltonian formalism for PDEs [22a, 25a, 26a, 13c, 29a, 33a, 34a, 37a, 38a, 40a, 41a, 42a, 44a, 45a, 46a, 47a, 48a, 49a, 50a, 53a, 54a, 55a, 17c], 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 computing with integrability operators (Hamiltonian, symplectic and recursion operators) [1f, 2f, 42a], and I wrote a book on it [3b]. Together with A.C. Norman I wrote a technical manual on REDUCE internals and programming [3f].

- **Applied Mathematics**: Numerical methods for industrial engineering applications [43a, 51a, 52a, 16c, 56a, 59a]. Scientific consultant of ESA for mathematical models in

antenna design [56a, 57a]. In this framework he is the inventor of a patent, see the list of publications.

- **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 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. (seminar delivered);
Apr 1997	Silesian University in Opava, Czech Rep. (seminar delivered)
Apr 1997	Masaryk University of Brno, Czech Rep. (seminar delivered)
Feb 2000	Independent University of Moscow http://ium.mccme.ru/english/
Apr 2001	Independent University of Moscow (seminar delivered)
Jun 2002	University of Twente, NL
Apr 2003	Independent University of Moscow
Apr 2004	Un. Roma "La Sapienza" (seminar delivered)
Apr 2007	Independent University of Moscow
Nov 2007	University of Olomouc (Czech Rep.)
Feb 2008	Independent University of Moscow (seminar delivered)
May 2008	Independent University of Moscow (seminar delivered)
Jul 2008	Un. of Salamanca, Spain
Nov 2008	Masaryk University of Brno, Czech Rep. (seminar delivered)
Mar 2009	Independent University of Moscow (seminar delivered delivered)
Sep 2009	University of Salamanca, Spain
Dec 2009	Independent University of Moscow (seminar delivered)
Lug 2010	University of Salamanca, Spain
Gen 2011	Independent University of Moscow
Apr 2011	Independent University of Moscow (seminar delivered)
Oct 2011	Università di Perugia
Nov 2011	Independent University of Moscow (seminar delivered)
Apr 2012	Independent University of Moscow
Sep 2012	Silesian Un. of Opava (Czech Rep.)
Mar 2013	SISSA, Trieste, Italy (seminar delivered).
Jul 2013	Rome, Italy (seminar delivered).
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 (seminar delivered).
Jan 2014	Imperial College (London, UK) (seminar delivered).

Feb 2014	Independent University of Moscow.
Jul 2014	Loughborough University.
Dec 2014	Silesian Univ. in Opava, Czech Rep. (seminar delivered).
Feb 2015	SISSA, Trieste, Italy (seminar delivered).
Feb 2015	Moscow, Russia. Seminar delivered at the research group of S.P. Novikov and V.I. Buchstaber, at the Moscow State University "Lomonosov", and a seminar at the Independent University of Moscow.
Mar 2015	Università di Roma 'La Sapienza'.
Mag 2015	Loughborough University.
Jul 2015	Universidad de Salamanca (seminar delivered).
Nov 2015	Loughborough University and University of Leeds (seminar delivered). 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 (with seminar).
Feb 2017	Università di Perugia.
Feb 2017	Independent University of Moscow (with seminar).
Jul 2017	Institute of Advanced Studies at the Loughborough University (UK) (20 days); University of Leeds (3 days), 3 seminars delivered.
Nov 2017	Loughborough University, University of Glasgow, University of Leeds, London Mathematical Society Scheme 4 grant, 3 seminars delivered.
Feb 2018	Università di Milano Bicocca.
Mar 2018	Research in pairs at the CIRM in Trento, 12 days with E.V. Ferapontov and M.V. Pavlov.
Jul 2018	Independent University of Moscow and Steklov Mathematical Institute; seminar delivered at the research group of S.P. Novikov and V.I. Buchstaber.
Dec 2018	Independent University of Moscow and Landau Institute for Theoretical Physics, Chernogolovka (I delivered a seminar).
Jan 2019	Loughborough University (Prof. Ferapontov)
Feb 2019	University of Amsterdam (Prof. Shadrin)
Feb 2019	Tsinghua University (Prof. Y. Zhang), and China University of Mines and Technology (Prof. K. Tian).
Apr 2019	Bauman Moscow State University of Technology (I delivered a lecture for students in Applied Mathematics).

May 2019	University of Leeds (invited speaker at a workshop).
Ott 2019	European Space Agency, sede ESTEC, Noordwijk, The Netherlands (Ing. P. Angeletti ed Ing. G. Toso); University of Amsterdam (Prof. Shadrin).
Dec 2019	Technical University of Turin (Politecnico) (Prof. G. Manno, invited seminar).
Gen 2020	European Space Agency, ESTEC, Noordwijk, The Netherlands (P. Angeletti, G. Toso); University of Amsterdam (Prof. Shadrin).
Oct 2020	Virtual seminar (invited) at the International Centre for Mathematical Sciences of Edimburgh (UK), series Virtual Integrable Systems Seminars https://www.icms.org.uk/events/event?id=1090
Apr 2021	Virtual seminar (invited) at the Instituto de Ciencias Matemáticas, Madrid, Spain https://www.icmat.es/es/actividades/seminarios/listado/?tipo=mecanica_geometrica
Jul 2021	Virtual seminar (invited) at the joint seminar Analysis & Geometry, École Politechnique Fédérale Lausanne (Switzerland) - Friedrich Schiller University of Jena (Germany).
Oct 2021	Independent University of Moscow (virtual).
Jan – June 2022	I spent the semester at the University of Amsterdam, The Netherlands, where I cooperated with Prof. S. Shadrin.
Jan 2023	University of Amsterdam, The Netherlands, (Prof. S. Shadrin).
Mar 2023	Technical University of Turin (Prof. G. Manno).
June-July	University of Amsterdam, The Netherlands, (Prof. S. Shadrin) and European Space Agency – ESTEC (P. Angeletti and G. Toso).
1998-2019	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 May. 2017. http://www.altamatematica.it/gnfm/it/node/20
2017	(invited speaker) Workshop on Geometry and Integrable Systems, SISSA, Trieste, June 2017. https://indico.sissa.it/event/16/
2018	(invited speaker) Dynamics Days in Loughborough, UK, 3-7 September 2018, http://dynamicsday2018.lboro.ac.uk/
2018	(also as an organizer) Local and Nonlocal geometry of PDEs and integrability, SISSA, Trieste, October 2018 http://gdeq.org.
2019	(invited speaker) Brackets, Reduction, and Integrability, University of Leeds, May 2019 http://www1.maths.leeds.ac.uk/cnls/research/integrable/cqi/2019/sol19.html.
2019	(invited speaker) Waves and Stability in Continuous Media (WASCOM), Maiori, June 2019.
2019	Computer Algebra and Scientific Computation, Moscow, August 2019 http://www.casc-conference.org/2019/.
2021	Applications of Computer Algebra, July 2021 https://sites.google.com/view/computational-diffalg-2021.
2021	(invited speaker) Conference in honour of the 75th birthday of A.K. Pogrebkov, September 2021 http://www.mathnet.ru/php/conference.phtml?confid=1949&option_lang=eng.
2021	International Conference on Integrable Systems and Nonlinear Dynamics https://lomonosov-msu.ru/eng/event/6844/.
2022	(invited speaker) Integrable systems, Frobenius manifolds and related topics, Université de Bourgogne-Franche-Comté, Dijon (France) https://gcarlet.perso.math.cnrs.fr/page/isfm2022/.
2023	(invited speaker) Symmetry and Perturbation Theory 2023, Otranto (Italy), 4-9 June 2023 http://www.sptspt.it.
2023	XXIII Congresso dell'Unione Matematica Italiana, Pisa 4-9 September 2023 https://umi.dm.unibo.it/congresso2023/.
2024	Workshop on Poisson brackets and Integrability, Korteweg–De Vries Institute of Mathematics, University of Amsterdam, 28/02-01/03/2024. https://gcarlet.perso.math.cnrs.fr/page/pbi2024/.

Conferences as an organizer

2000-2003 Member of the organizing committee 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 Member of the organizing committee of the meeting *Simmetrie ed Equazioni Differenziali: aspetti teorici ed applicativi* in Lecce (Italy) from 5 to 7 February 2004.

2007 Member of the organizing committee of the VI conference *Symmetry and perturbation theory*, Otranto 2–9 June 2007; see http://www.sptspt.it/.

2011 Member of the organizing committee of the VII conferece *Symmetry and perturbation theory*, held in Otranto from 5 to 12 June 2011, see http://www.sptspt.it/.

2011 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 Member of the organizing committee 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 Member of the organizing committee of the conference "Physics and Mathematics of Nonlinear Phenomena", held in Gallipoli (Italy) 22–29/07/2013.

2015 Member of the organizing committee of the conference "Physics and Mathematics of Nonlinear Phenomena", held in Gallipoli (Italy) Gallipoli, 20–27 June 2015 http://pmnp.unisalento.it

2015 Member of the organizing committee of the conference Workshop on Integrable Nonlinear Equations, Mikulov (Czech Republic), October 2015 http://gdeq.org/Workshop_on_Integrable_Nonlinear_Equations

2017 Member of the organizing committee of the conference Physics and Mathematics of Nonlinear Phenomena: 50 years of Inverse Scattering Transform, Gallipoli, 17–24 giugno 2017 http://pmnp.unisalento.it

2018 Member of the organizing committee of the conference Geometric Structures in Integrable Systems, 19–21 September 2018 http://gsis2018.unisalento.it

2018 Member of the organizing committee of the conference "Local and Nonlocal geometry of PDEs and integrability", 8–12 October 2018 http://gdeq.org

2019	Member of the scientific committee of the conference "Classical and modern geometry", April 2019, Moscow Pedagogical State University, Russia http://conf2.d-omega.org/eng/
2021	Member of the organizing committee of the school and workshop on Topological Recursion, Otranto (Lecce, Italy) September 2021 http://trsalento2020.eu/.

Editorial activity.

I have been a referee for the following journals:

1. Acta Applicandae Mathematicae,
2. Analysis and Mathematical Physics,
3. Applied Mathematics and Computation,
4. Applied Mathematics Letters,
5. Archivum Mathematicum (Brno),
6. Atti della Accademia Peloritana dei Pericolanti - Classe di Scienze Fisiche, Matematiche e Naturali.
7. Central European Journal of Mathematics,
8. Communications in Nonlinear Science and Numerical Simulation,
9. Czechoslovak Mathematical Journal,
10. Demonstratio Mathematica,
11. Differential Geometry and its Applications,
12. Chinese Journal of Physics,
13. Classical and Quantum Gravity,
14. European Journal of Applied Mathematics,
15. European Physical Journal Plus,
16. International Journal of Geometric Methods in Modern Physics,
17. International Journal of Non-Linear Mechanics,
18. Journal of Computational Science,
19. Journal of Geometry and Physics,

20. Journal of Mathematical Analysis and Applications,

21. Journal of Mathematical Physics,

22. Journal of Nonlinear Mathematical Physics,

23. Journal of Physics A: math. theor.,

24. La Matematica,

25. Letters in Mathematical Physics,

26. Mathematics and Mechanics of Complex Systems,

27. Mathematics and Mechanics of Solids,

28. Mathematical Methods in the Applied Sciences,

29. Mathematical Physics, Analysis and Geometry,

30. Mathematical Proceedings of the Cambridge Philosophical Society,

31. Nonlinear Analysis Series A: Theory, Methods & Applications,

32. Nonlinearity,

33. Note di Matematica,

34. Physics Letters A,

35. Proceedings of the Royal Society A,

36. Proceedings of the Royal Society of Edinburgh,

37. Qualitative Theory of Dynamical Systems,

38. Real Academia de Ciencias (Spagna),

39. Reports on Mathematical Physics,

40. Rivista Matematica dell'Università di Parma,

41. SIGMA – Symmetry, Integrability and Geometry: Methods and Applications,

42. Studies in Applied Mathematics,

43. Symmetry.

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

Grants

Funded research projects

1998-today	My research activity was continuously supported by the Dipartimento di Matematica e Fisica "E. De Giorgi" 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.
2014	PON Ricerca e Competitività 2013 – EDOC@WORK 3.0. http://www.ponrec.it/open-data/progetti/scheda-progetto?ProgettoID=5831#Descrizione, 16000EUR.
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.
2016	INFN: grant of 1000EUR for traveling and 700EUR for the purchase of a laptop.
2017	INFN: grant of 1000EUR for traveling.
2018	INFN: grant of 1000EUR for traveling.
2018	GNFM: grant of 1000EUR for a visit of J. Krasil'shchik.
2019	London Mathematical Society Visitors Grant (Scheme 2), 950£. Visit to Loughborough Univ. (prof. E.V. Ferapontov).

2019	INFN: grant of 1000EUR for traveling.
2019–2020	European Space Agency: consultancy contract for the implementation of numerical algorithms for a problem of optimal transport. 7000EUR.
2020	INFN: grant of 1000EUR for traveling and 1400EUR for the purchase of a laptop.
2021–2023	INFN: principal investigator ('coordinatore nazionale') of a national grant Iniziativa Specifica 'Mathematical Methods in Non Linear Physics', Commissione Scientifica Nazionale gruppo 4 - Fisica Teorica. Teams involved: Università del Salento (5 people), Università di Roma La Sapienza (6 people), Università di Milano Bicocca (5 people), and from June 2022 SISSA–Universit'a di Trieste (6 people). Duration of the grant: 2021-2023. Budget: 15000EUR in 2021, 30000EUR in 2022, 50000EUR in 2023.
2021–2022	European Space Agency: consultancy contract for the implementation of numerical algorithms for a problem of optimal transport. 20000EUR.
2022	Dutch Research Council (NWO): grant for a visiting academic position at the University of Amsterdam, collaboration with Prof. S. Shadrin. Budget: 7500EUR.
2023	PRIN 2022TEB52W 'The charm of Integrability: from nonlinear waves to random matrices', PI: Tamara Grava (SISSA, Italy), member of the Cagliari Unit.
2021–2023	INFN: principal investigator ('coordinatore nazionale') of a national grant 'Iniziativa Specifica' 'Mathematical Methods in Non Linear Physics', Commissione Scientifica Nazionale gruppo 4 - Fisica Teorica. Teams involved: Section of Lecce (5 researchers), Section of Roma 1 (6 researchers), Section of Milano (4 researchers), Section of Milano Bicocca (5 researchers), Section of Torino (2 researchers), Section of Trieste (6 researchers). Duration of the grant: 2024-2026. Budget: about 70000EUR/year.
2024	European Space Agency: scientific consultancy contract for the implementation of numerical algorithms for an Optimal Transport problem, 20000EUR.

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.
2018	Referee for the evaluation of achievements of two FIRB projects of the Italian Ministry of Education.
2021	External expert for the VQR 2015–2019 (Italian research assessment exercise). Six papers refereed.

Teaching activity

Courses (as a teacher)

2000-2001	Temporary teacher in Geometry and Algebra, Information Engineering, Un. Lecce (2 academic years)
2002-2003	Temporary teacher in Geometry and Algebra, Management Engineering, Un. Lecce (2 academic years)
2004-2005	Course of **Matrix Computations**, Master in Automation, Communication, Information engineering Un. Lecce (2 academic years)
2004-2008	Courses of **Geometry and Algebra**, Batchelor in Information Engineering Un. Lecce (5 academic years)
2006-2013	Courses of **Geometry and Algebra**, Batchelor in Management and Industrial Engineering Un. Lecce (8 academic years)
2006-2008	Course of **Numerical Analysis**, Master in Aerospace Engineering Un. Lecce (3 academic years)
2006-2008	Courses of **Laboratory of Numerical Analysis**, Master in Aerospace Engineering Un. Lecce (3 academic years)
2007-present	Course of **Mathematical and Numerical Methods for Aerospace Engineering with Laboratory**, Master in Aerospace Engineering, Un. Salento (17 academic years)
2013-2014	Course **Mathematical Physics**, Batchelor in Mathematics, Un. Salento (1 academic year)
2014-2015	Course **Rational Mechanics**, Batchelor in Civil Engineering, Un. Salento (3 academic years)
2014-2016	Course **Rational Mechanics**, Batchelor in Industrial Engineering, Un. Salento (3 academic years)
2015-2016	Course **Rational Mechanics**, Batchelor in Industrial Engineering, site of Brindisi, Un. Salento (2 academic years)
2016-present	Course **Mathematical Physics**, Master in Mathematics, Un. Salento (8 academic years)
2021-2022	Course **Mathematics for Environmental Sciences**, Master in Environmental Sciences, Un. Salento (2 academic years)
2022-2023	Visiting Professor of the Technical University of Krakow (Poland), course **Computational Mathematics** Batchelor in Computer Science (2 academic years)
2023	Course **Mathematics**, Batchelor in Environmental Sciences, Un. Salento (1 academic year)

2023	Two courses **Rational Mechanics**, Batchelors in Civil Engineering and Industriale Engineering.

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

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 the 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.
2015	E. Del Core, 'Sull'integrabilità del corpo rigido', master degree in Mathematics.
2018	P. Vergallo, 'The geometry of Hamiltonian formalism for PDEs', master degree in Mathematics.
2019	N. Cretì, 'Finite difference model of wave motion for structural health monitoring', master degree in Mathematics.
2020	A. Giannotta, 'Varietà riemanniane: La Seconda Forma Fondamentale', batchelor in Mathematics.
2023	A.F. Marinelli, 'Integrabilità di sistemi hamiltoniani', master degree in Mathematics.
2023	A. Prete, 'La trasformata spettrale inversa e le equazioni KdV e WDVV', master degree in Mathematics.
2010-present	Co-advisor of many degree thesis in Engineering.
1999-present	Member of the degree exam committee in Mathematics (batchelor and master) and in Aerospace Engineering (master).

PhD schools and courses

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, 2021-today	Member of the advisory board of the Ph.D. in Mathematics (consortium between the Università del Salento and the Università degli Studi della Basilicata).

2019	PhD course of 30 hours on *Geometry of Jet Spaces and Integrability of PDEs*, Ph.D. in "Matematica e Informatica" Università del Salento and Università degli Studi della Basilicata.

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.
2018-2022	PhD advisor of P. Vergallo.
2019-2020	Tutor of J. Vašíček, PhD student at the Silesian University in Opava (Czech Rep.) on a one-year Erasmus leave to the Department of Mathematics and Physics, Università del Salento. Selected as the best 2021 paper in the Institute of Mathematics, Silesian University in Opava.
2022	Referee of the Ph.D. thesis of Francisco Hernandez Iglesias (Joint Ph.D. Université de Bourgogne – University of Amsterdam, supervisors: G. Carlet and S. Shadrin).
2023	Tutor of a 2-years INFN (National Institute of Nuclear Physics) Resarch Fellow on 'Integrable Systems', Stanislav Opanasenko (beginning of the contract: 1st October 2023).

Other courses

1994-1996	Teaching assistant at the Diploma Universitario in Environmental Engineering, Univ. Florence.
1998-2001	Teaching assistant at the Diploma Universitario a distanza in Information Engineering, Consorzio Nettuno.
1998-2001	Teaching assistant at the Diploma in Logistics and Production Engineering, Università di Lecce.
2000-2001	Tutoring in Geometry (30 hours), Faculty of Engineering (all courses).
2000	Course on digital tipography and LaTeXaimed at writing a thesis and/or research papers (10 hours)
2001-2003	Teacher of 'Matematica II' for the Diploma a distanza in Information Engineering, Consorzio Nettuno

2002-2009	Course *Laboratory for multimedia in teaching mathematics* (20 hours on LaTeX, Octave, Maxima) and 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	Course *Innovative technologies for teaching/learning mathematics* at the State School for the Qualification of Teachers in High Schools in Bari (30 hours).
2013	Module "Matematica 2" within the Course ITS "Higher technician for production and maintenance of means of transport and their infrastructures" (25 hours).
2016	Module "Matematica 2" within the Course ITS "Higher technician for production and maintenance of means of transport and their infrastructures" (25 hours).
2018	Module "Matematica 2" within the Course ITS "Higher technician for production technologies in aerospace industry" (25 hours).
2018	Module "Matematica 2" within the Course ITS "Higher technician for production and maintenance of ships" (25 hours).
2018	Module "Modelli Numerici in Meteorologia ed Oceanografia" (32 hours) at the Master in Meteorology and Physical Oceanography (Università del Salento – Università Parthenope di Napoli).
2019	Module "Matematica 2" within the Course ITS "Higher technician for production technologies in aerospace industry" (25 hours).
2020	Module "Matematica 2" within the Course ITS "Higher technician for production technologies in aerospace industry" (25 hours).
2020	Module "Modelli Numerici in Meteorologia ed Oceanografia" (32 hours) at the Master in Meteorology and Physical Oceanography (Università del Salento – Università Parthenope di Napoli).
2022 and 2023	Module "Numerical Mathematics" (60 hours) as a visiting professor at the Technical University of Krakow (Poland, online).

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.
2020	Member of the selection committee for a 3-years position as a researcher in Mathematical Physics at the Università del Salento (RTDA).
2021	Member of the selection committee for a tenure track position as a researcher in Mathematical Physics at the Università di Milano Bicocca (RTDB).
2021	Member of the habilitation committee for the candidate Hynek Baran, Silesian University at Opava, Czech Republic.
2021–today	Delegate of the Dipartimento di Matematica e Fisica for international relations.
2021–today	Member of the committee for software licenses of the Dipartimento di Matematica e Fisica.
2004–today	Member of the selection committee for PhD students at the Department of Mathematics, then Department of Mathematics and Physics, Università del Salento, in 2004, 2010, 2015, 2020.
2023	Member of the selection committee for a research fellow position in Mathematical Physics (Joint Italian-Israelian research project, 2022) at the Università del Salento.
2023	Member of the selection committee for a research fellow position in Mathematical Physics (PRIN 2020) at the Università del Salento.
2023	Member of the selection committee for a research fellow position (one year) in Mathematical Physics (project *Development of rigorous mathematical techniques in the Statistical Mechanics of neural networks.*) at the University of Salento.
	Member of the selection committee for a research fellow position (one year) in Mathematical Physics (project BULBUL CUP F85F21006230001 *Brain-inspired ULtra- fast and ULtra-sharp machines for AI-assisted healthcare*) at the University of Salento.
2023	Member of the selection committee for a tenure track position as an associate professor in Mathematical Physics at the (state) Università Parthenope of Naples.

Miscellanea

Interests in Computer Science

LaTeX	Good knowledge of TeX/LaTeX. Member of the editorial board of the italian journal of TeX/LaTeX, ArsTeXnica, published by the Gruppo Utenti Italiani TeX/LaTeX(GUIT) from the foundation up to 2014. Creator and maintainer of 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	Linux user since 1998, good system administration abilities.
Reduce	Maintainer of CDIFF and developer of CDE, REDUCE 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/.
Matlab/Octave	Teaching Numerical Analysis also through code written in Matlab language. Scientific paper with numerical computations applied to industrial problems [43a,52a,57a,58a].
HTML and CSS	I have good HTML and CSS coding ability for building simple web sites.

Language abilities

Italian	mother tongue.
English	level C1 self-assessed. Academic visitor for 6 months in UK, several seminars in UK universities delivered so far.
Spanish	level B2 self-assessed. Academic visitor for several months alltogether in Spain, mostly in Salamanca; delivered seminars in Spanish.
French	Good understanding of written texts, and basic abilities of conversation.
Russian	basic speaking and reading abilities.

Popularization of science

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

In cooperation with F. Paparella the paper [2e] on numerical computations with Octave was written.

Lecce, April 7, 2024

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: doi:10.1093/imrn/rnv369 ArXiv: 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, ArXiv: 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. ArXiv: 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, ArXiv: 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*, Lett. Math. Phys. **108**, Issue 6 (2018), 1525-1550, ArXiv: https://arxiv.org/abs/1703.06173.

[41a] M. Casati, E.V. Ferapontov, M.V. Pavlov, R.F. Vitolo: *On a class of third-order nonlocal Hamiltonian operators*, J. Geom. Phys. **138** (2019), 285–296 DOI: https://doi.org/10.1016/j.geomphys.2018.10.018, ArXiv: https://arxiv.org/abs/1805.00746.

[42a] R. Vitolo: *Computing with Hamiltonian operators*, Computer Physics Communications Volume **244** (2019), 228-245, DOI: https://doi.org/10.1016/j.cpc.2019.05.012 ArXiv: https://arxiv.org/abs/1808.03902.

[43a] S. Carrino, F. Nicassio, G. Scarselli, R. Vitolo: *Finite difference model of wave motion for Structural Health Monitoring of Single Lap Joints*, Int. J. of Solids and Structures **161** (2019), 219–227, DOI: https://doi.org/10.1016/j.ijsolstr.2018.11.019.

[44a] M.V. Pavlov, R.F. Vitolo: *Bi-Hamiltonian structure of the Oriented Associativity equation*, J. Phys. A: Theor. Math. – Letters, **52** no. 20 (2019), DOI: https://doi.org/10.1088/1751-8121/ab15f4, ArXiv: https://arxiv.org/abs/1812.01413.

[45a] M. Casati, P. Lorenzoni, R. Vitolo: *Three computational approaches to weakly nonlocal Poisson brackets*, Studies in Applied Mathematics **144** no. 4 (2020) 412–448, DOI: 10.1111/sapm.12302, arXiv: https://arxiv.org/abs/1903.08204.

[46a] P. Lorenzoni, R. Vitolo: *Weakly nonlocal Poisson brackets, Schouten brackets and supermanifolds*, J. Geom. Phys. **149** (2020) 103573, DOI: https://doi.org/10.1016/j.geomphys.2019.103573, ArXiv: https://arxiv.org/abs/1909.07695.

[47a] P. Vergallo, R. Vitolo: *Homogeneous Hamiltonian operators and the theory of coverings*, Diff. Geom. Appl. **75** (2021) 101713, arXiv: https://arxiv.org/abs/2007.15294.

[48a] M.V. Pavlov, P. Vergallo, R. Vitolo: *Classification of bi-Hamiltonian pairs extended by isometries*, Proceedings of the Royal Society A 20210185 (2021), arXiv: https://arxiv.org/abs/2011.04073.

[49a] M. Casati, P. Lorenzoni, D. Valeri, R. Vitolo: Weakly nonlocal Poisson brackets: tools, examples, computations, Computer Physics Communications 274 (2022) 108284, DOI: https://doi.org/10.1016/j.cpc.2022.108284, arXiv: https://arxiv.org/abs/2101.06467.

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