

Luca Vitagliano

Curriculum Vitae

Research Interests

Differential Geometry and Mathematical Physics: Differential Geometry of PDEs, Differential Geometric Methods in Classical Mechanics and Field Theory, Homological Methods in Geometry and Mathematical Physics, Graded Geometry, Homotopy Algebras, Differential Calculus and Commutative Algebra, Poisson Geometry, Lie Algebroids/Groupoids.

Positions

Current

2020–Present **Associate Professor**, *Department of Mathematics*, Università di Salerno, Italy.

Past

2008–2020 **Researcher (Tenured)**, *Department of Mathematics*, Università di Salerno, Italy.

2004–2008 **Research Fellow**, *Department of Mathematics and Computer Science*, Università di Salerno, Italy.
Research group of Prof. A. M. Vinogradov.

Education

2004 **Ph.D. in Physics**, *Department of Physics*, University of Rome “La Sapienza”, Italy.
Advisor: Prof. R. Ruffini.
Thesis Title: *Electromagnetic Black Holes as Astrophysical Energy Sources*.

2000 **M.Sc. in Physics**, *Faculty of Sciences*, University of Napoli “Federico II”, Italy.
Advisors: Prof. G. Marmo, Dr. G. Bimonte.
Thesis title: *Moto di una Sorgente Estesa del Campo Elettromagnetico su uno Spazio-Tempo Curvo (Motion of an Extended Source of the Electromagnetic Field in a Curved Space-Time)*.

Awards and Honours

2022 **Plenary speaker**, *Poisson 2022*, Madrid, Spain.

2018 **Italian National Scientific Habilitation (ASN)**, *Full Professor 01/A2 (Algebra and Geometry)*, expiration date: September 18, 2027.

2017 **Foreign faculty - approved course**, *GIAN Initiative of the Indian Government*, IIT Kanpur, Kanpur, Uttar Pradesh, India.

- 2016 **Shapiro visiting professor**, *Department of Mathematics*, Penn State University, State College (PA), USA.
- 2013 **Plenary speaker**, *Differential Geometry and its Applications*, Brno, Czech Republic.

Grants

Research grants

- 2010–2012 **PRIN 2008**, *Grant of the Italian Ministry of Education, University and Research..*
Role: Participant.
Project leader: Prof. A. M. Vinogradov.
Project title: *Geometria delle equazioni differenziali non lineari alle derivate parziali e applicazioni alla fisica teorica.*

Fellowships

- 2004–2008 **Research Fellowship**, *Department of Mathematics and Computer Science*, Università di Salerno, Italy.
- 2000–2003 **Ph.D. Fellowship**, *Department of Physics*, University of Rome “La Sapienza”, Italy.

Conference Fundings

- 2019 **INdAM Grant**, *INdAM Intensive Period*, Poisson Geometry and Mathematical Physics, 2020 (CANCELLED).
Role: Scientific Manager.
Amount awarded: 20.000 EUR.
- 2018 **INdAM Grant**, *INdAM Workshop*, Poisson Geometry and Higher Structures.
Role: Scientific Manager.
Amount awarded: 15.000 EUR.
- 2012 **ESF Grant**, *ESF Follow-up Strategic Meeting*.
Role: Convenor.
Amount awarded: 5.000 EUR.
- 2011 **ESF Grant**, *ESF Exploratory Workshop EX10-078*, Current Problems In Differential Calculus Over Commutative Algebras, Secondary Calculus, And Solution Singularities Of Nonlinear PDEs.
Role: Convenor.
Amount awarded: 15.000 EUR.

Publications

Mathematics books

- 2021 • *The Linear Algebra of (Dirac-)Jacobi Geometry*, Aula Magna - Editura Universitatii de Vest, West University of Timișoara, Timișoara, Romania,
ISBN: 978-973-125-821-8
(with E. M. Cioroianu, A. G. Tortorella, and C. Vizman).

Mathematics research papers

- 2021 • *Multiplicative Connections and Their Lie Theory*, Commun. Contemp. Math., accepted for publication,
e-print: arXiv:2011.04597
(with F. Pugliese, and G. Sparano).

- *Fiber-Wise Linear Differential Operators*,
Forum Math., published online: <https://doi.org/10.1515/forum-2021-0100>,
e-print: arXiv:2011.13192
(with F. Pugliese, and G. Sparano).
- 2020
- *Strongly Homotopy Lie Algebras and Deformations of Calibrated Submanifolds*,
Asian J. Math., accepted for publication,
e-print: arXiv:1804.05732
(with D. Fiorenza, H. V. Lê, and L. Schwachhöfer).
 - *Homogeneous G-Structures*,
Ann. Mat. Pura Appl. 199, 2357–2380,
e-print: arXiv:1907.06449
(with A. G. Tortorella, and O. Yudilevich).
 - *Holomorphic Jacobi Manifolds and Holomorphic Contact Groupoids*,
Math. Z. 294, 1181–1225,
e-print: arXiv:1710.03300
(with A. Wade).
 - *The Local Structure of Generalized Contact Bundles*,
Int. Math. Res. Not. 2020, No. 20, 6871–6925,
e-print: arXiv:1711.08310
(with J. Schnitzer).
- 2019
- *Holomorphic Jacobi Manifolds*,
Int. J. Math., published online, doi:10.1142/S0129167X2050024X,
e-print: arXiv:1609.07737
(with A. Wade).
 - *Deformations of Linear Lie Brackets*,
Pacific J. Math. 303, 265–298,
e-print: arXiv:1805.02108
(with P. P. La Pastina).
 - *Infinitesimal Automorphisms of VB-Groupoids and Algebroids*,
Quart. J. Math. 70, 1039–1089,
e-print: arXiv:1611.06896
(with C. Esposito, and A. G. Tortorella).
 - *Higher Omni-Lie Algebroids*,
J. Lie Theory 29 (2019), 881–899,
e-print: arXiv:1812.09496
(with Y. Bi, and T. Zhang).
- 2018
- *Deformations of Coisotropic Submanifolds in Jacobi Manifolds*,
J. Sympl. Geom. 16, 1051–1116,
e-print: arXiv:1410.8446
(with H. V. Lê, Y.-G. Oh, and A. G. Tortorella).
 - *Dirac-Jacobi Bundles*,
J. Sympl. Geom. 16, 485–561,
e-print: arXiv:1502.05420.

- *Deformation Cohomology of Lie Algebroids and Morita Equivalence*,
C. R. Acad. Sci. Paris, Ser. I 356, 376–381,
e-print: arXiv:1801.10052
(with G. Sparano).
- *Representations up to Homotopy from Weighted Lie Algebroids*,
J. Lie Theory 28, 715–737,
e-print: arXiv:1705.02114
(with A. J. Bruce, and J. Grabowski).
- 2017 • *Jacobi Bundles and the BFV-Complex*,
J. Geom. Phys. 121, 347–377,
e-print: arXiv:1601.04540
(with H. V. Lê, and A. G. Tortorella).
- 2016 • *Vector Bundle Valued Differential Forms on NQ-manifolds*,
Pacific J. Math. 283, 449–482,
e-print: arXiv:1406.6256.
- *Generalized Contact Bundles*,
C. R. Acad. Sci. Paris, Ser. I, 354, 313–317,
e-print: arXiv:1507.03973
(with A. Wade).
- 2015 • *Tulczyjew Triples in Higher Derivative Field Theory*,
J. Geom. Mech. 7, 1–33,
e-print: arXiv:1406.6503
(with K. Grabowska).
- *L_∞ -algebras from Multicontact Geometry*,
Diff. Geom. Appl. 39, 147–165,
e-print: arXiv:1311.2751.
- *On the Strong Homotopy Associative Algebra of a Foliation*,
Commun. Contemp. Math. 17, 1450026 (34 pages),
e-print: arXiv:1212.1090.
- *Representations of Homotopy Lie-Rinehart Algebras*,
Math. Proc. Camb. Phil. Soc. 158, 155–191,
e-print: arXiv:1304.4353.
- 2014 • *Characteristics, Bicharacteristics, and Geometric Singularities of Solutions of PDEs*,
Int. J. Geom. Meth. Mod. Phys. 11, 1460039 (35 pages),
e-print: arXiv:1311.3477.
- *On the Strong Homotopy Lie-Rinehart Algebra of a Foliation*,
Commun. Contemp. Math. 16, 1450007 (49 pages),
e-print: arXiv:1204.2467.
- 2013 • *Partial Differential Hamiltonian Systems*,
Canad. J. Math. 65, 1164–1200,
e-print: arXiv:0903.4528.

- 2012 • *Geometric Hamilton-Jacobi Field Theory*,
Int. J. Geom. Meth. Mod. Phys. 9, 1260008 (8 pages),
e-print: arXiv:1109.1677.
- 2011 • *On Higher Derivatives as Constraints in Field Theory: a Geometric Perspective*,
Int. J. Geom. Meth. Mod. Phys. 8, 1687–1693,
e-print: arXiv:1009.6054.
- *Hamilton-Jacobi Diffieties*,
J. Geom. Phys. 61, 1932–1949,
e-print: arXiv:1104.0162.
- 2010 • *The Hamilton-Jacobi Formalism for Higher Order Field Theories*,
Int. J. Geom. Meth. Mod. Phys. 7, 1413–1436,
e-print: arXiv:1003.5236.
- *The Lagrangian-Hamiltonian Formalism for Higher Order Field Theories*,
J. Geom. Phys. 60, 857–873,
e-print: arXiv:0905.4580.
- 2009 • *Secondary Calculus and the Covariant Phase Space*,
J. Geom. Phys. 59, 426–447,
e-print: arXiv:0809.4164.
- 2007 • *Iterated Differential Forms: The $\Lambda_{k-1}\mathcal{C}$ -Spectral Sequence on Infinite Prolonged Equations*,
Dokl. Math. 76, n° 2, 692–695,
e-print: arXiv:math/0703761
(with A. M. Vinogradov).
- *Iterated Differential Forms: The $\Lambda_{k-1}\mathcal{C}$ -Spectral Sequence on Infinite Jets*,
Dokl. Math. 76, n° 2, 673–677,
e-print: arXiv:math/0703661
(with A. M. Vinogradov).
- *Iterated Differential Forms IV: C-Spectral Sequence*,
Dokl. Math. 75, n° 3 (2007) 403–406,
e-print: arXiv:math/0610917
(with A. M. Vinogradov).
- *Iterated Differential Forms III: Integral Calculus*,
Dokl. Math. 75, n° 2 (2007) 177–180,
e-print: arXiv:math/0610914
(with A. M. Vinogradov).
- 2006 • *Iterated Differential Forms: Riemannian Geometry Revisited*,
Dokl. Math. 73, n° 2 (2006) 182–184,
e-print: arXiv:math/0609287
(with A. M. Vinogradov).
- *Iterated Differential Forms: Tensors*,
Dokl. Math. 73, n° 2 (2006) 169–171,
e-print: arXiv:math/0605113
(with A. M. Vinogradov).

Mathematics Conference Proceedings

- 2009 • *On the Geometry of Partial Differential Hamiltonian Systems*,
in: Proceedings of the XI International Conference on “Geometry, Integrability
and Quantization”, June 5–10, 2009, Varna, Bulgaria (Eds. I. Mladenov, G. Vilasi,
A. Yoshioka), Avangard Prima, Sofia, 2010, pp. 221–230.

Mathematics Pre-Prints

- 2019 • *Deformations of Vector Bundles over Lie Groupoids*,
e-print: arXiv:1907.05670
(with P. P. La Pastina).

Old Physics Papers

- 2005 • *Observational Signatures of an Electromagnetic Overcritical Gravitational Col-
lapse*,
Int. J. Mod. Phys. D14, 131–141
(with R. Ruffini, F. Fraschetti, and S.-S. Xue).
- 2003 • *On a Separatrix in the Gravitational Collapse to an Electromagnetic Black Hole*,
Phys. Lett. B573, 33–38
(with R. Ruffini, and S.-S. Xue).
- *Plasma Oscillations in Strong Electric Fields*,
Phys. Lett. B559, 12–19
(with R. Ruffini, and S.-S. Xue).
- *Energy Extraction from Gravitational Collapse to Static Black Holes*,
Int. J. Mod. Phys. D12, 121–127
(with R. Ruffini).
- 2002 • *Irreducible Mass and Energetics of an Electromagnetic Black Hole*,
Phys. Lett. B545, 233–237
(with R. Ruffini).
- *On the Electromagnetic Field of Charged Collapsing Spherical Shells in General
Relativity*,
Phys. Lett. B545, 226–232
(with R. Ruffini, and C. Cherubini).

Old Physics Conference Proceedings

- 2007 • *The Blackholic energy and the canonical Gamma-Ray Burst*,
in: Proceedings of the “XIIth Brazilian School of Cosmology and Gravitation”,
September 10–23, 2006, Rio de Janeiro, Brazil (Eds. M. Novello, and S. E. Perez-
Bergliaffa), AIP Conf. Proc. 910, 55–217
(with R. Ruffini, M. G. Bernardini, C. L. Bianco, L. Caito, P. Chardonnet, M. G. Dain-
otti, F. Fraschetti, R. Guida, M. Rotondo, G. Vereshchagin, and S.-S. Xue).
- 2006 • *Theoretical predictions of spectral evolution of short GRBs*,
in: Proceedings of “Swift and GRBs: Unveiling the Relativistic Universe”, June 5–9,
2006, Venice, Italy (Eds. S. Campana, S. Covino, G. Tagliaferri, and G. Chincarini),
Nuovo Cim. 121B, 1477–1478
(with F. Fraschetti, R. Ruffini, and S.-S. Xue).

- 2005
- *Electron-Positron-Photon Plasma around a Collapsing Star*,
in: Proceedings of the MG10 Meeting on Recent Developments in Theoretical and Experimental General Relativity, Gravitation and Relativistic Field Theories, July 20–26, 2003, Rio de Janeiro, Brazil (Eds. M. Novello, S. E. Perez-Bergliaffa, and R. Ruffini), World Scientific, Singapore (with R. Ruffini, and S.-S. Xue).
 - *Magnetic Fields in GRB Progenitors*,
in: Proceedings of the MG10 Meeting on Recent Developments in Theoretical and Experimental General Relativity, Gravitation and Relativistic Field Theories, July 20–26, 2003, Rio de Janeiro, Brazil (Eds. M. Novello, S. E. Perez-Bergliaffa, and R. Ruffini), World Scientific, Singapore (with F. Mattei, and R. Ruffini).
 - *Black hole physics and astrophysics: The GRB-Supernova connection and URCA-1 - URCA-2*,
in: Proceedings of the MG10 Meeting on Recent Developments in Theoretical and Experimental General Relativity, Gravitation and Relativistic Field Theories, July 20–26, 2003, Rio de Janeiro, Brazil (Eds. M. Novello, S. E. Perez-Bergliaffa, and R. Ruffini), World Scientific, Singapore (with R. Ruffini, M. G. Bernardini, C. L. Bianco, P. Chardonnet, F. Fraschetti, V. Gurzadyan, and S.-S. Xue).
 - *The Blackholic energy: long and short Gamma-Ray Bursts (New perspectives in physics and astrophysics from the theoretical understanding of Gamma-Ray Bursts, II)*,
in: "XIth Brazilian School of Cosmology and Gravitation", July 26 – August 04, 2004, Mangaratiba, Rio de Janeiro, Brazil (Eds. M. Novello, and S. E. Perez-Bergliaffa), AIP Conf. Proc. 782, 42–127 (with R. Ruffini, M. G. Bernardini, C. L. Bianco, P. Chardonnet, F. Fraschetti, V. Gurzadyan, and S.-S. Xue).
 - *Extracting energy from black holes: "long" and "short" GRBs and their astrophysical settings*,
in: Proceedings of "Gamma-Ray Burst in the Afterglow Era: 4th Workshop", October 18–22, 2004, Rome, Italy (Eds. L. Piro, L. Amati, S. Covino, and B. Gendre), Nuovo Cim. 28C, 589–596 (with R. Ruffini, M. G. Bernardini, C. L. Bianco, P. Chardonnet, F. Fraschetti, V. Gurzadyan, M. Lattanzi, and S.-S. Xue).
- 2004
- *Plasma Expansion in the Geometry of a Collapsing Star*,
in: Quantum Aspects of Beam Physics. Proceedings of the Joint 28th ICFA Advanced Beam Dynamics and Advanced & Novel Accelerators Workshop, January 7–11, 2003, Hiroshima, Japan (Eds. P. Chen, and K. Reil), World Scientific, Singapore (with R. Ruffini, and S.-S. Xue).
 - *Electron-Positron-Photon Plasma around a Collapsing Star*,
in: Quantum Aspects of Beam Physics 2003, Proceedings of the Joint 28th ICFA Advanced Beam Dynamics and Advanced & Novel Accelerators Workshop, January 7–11, 2003, Hiroshima, Japan (Eds. P. Chen, and K. Reil), World Scientific, Singapore (with R. Ruffini, and S.-S. Xue).

- 2003 • *New perspectives in physics and astrophysics from the theoretical understanding of Gamma-Ray Bursts*,
 in: Proceedings of the Xth Brazilian School of Cosmology and Gravitation, July 29 – August 9, 2002, Mangaratiba, Rio de Janeiro, Brazil (Eds. M. Novello, and S. E. Perez-Bergliaffa), AIP Conf. Proc. 668, 16–107
 (with R. Ruffini, C. L. Bianco, P. Chardonnet, F. Fraschetti, and S.-S. Xue).

Talks, Courses and Short Visits

Invited talks at conferences

- 2021 • *Multiplicative Connections on Lie Groupoids*,
 Geometry for Higher Spin Gravity: Conformal Structures, PDEs, and Q-manifolds, Vienna, Austria (*online*).
- 2019 • *The Deformation Cohomology of VB Algebroids*,
 Supergeometry, Supersymmetry and Quantization, Luxembourg City, Luxembourg.
- *Products in Jacobi Geometry*,
 International Conference on Poisson Geometry, Rio de Janeiro, Brazil.
- *Representations of Homotopy Lie Algebroids*,
 Workshop on Singular Foliations, Leuven, Belgium.
- *Homological Reduction in Contact Geometry*,
 Quantum Structure of Space-Time: Generalized Geometry and Symmetries, Bayrischzell, Germany.
- 2017 • *Homotopy Algebras and PDEs*,
 Lie Pseudogroups: Old and New, Driebergen, The Netherlands.
- *The Deformation L_∞ -algebroid of a Foliation*,
 Noncommutative Geometry and Higher Structures, Würzburg, Germany.
- *Holomorphic Jacobi Manifolds*,
 Joint Symplectic Seminar Cornell University – PSU, Ithaca (NY), USA.
- 2016 • *L_∞ -algebroids and BV_∞ Algebras*,
 GAP XIV - "Graded Geometry", Sheffield, UK.
- *Dirac-Jacobi Bundles and Their Local Structure*,
 Poisson Geometry and Mathematical Physics, Tianjin, China.
- 2015 • *Vector Bundle Valued Differential Forms on NQ -manifolds*,
 Geometry of Jets and Fields, Bedlęwo, Poland (**plenary lecture**).
- 2013 • *Homotopy Algebras and the Geometry of PDEs*,
 Differential Geometry and its Applications, Brno, Czech Republic (**plenary lecture**).
- *Left/Right Representations of Homotopy Lie-Rinehart Algebras*,
 Higher Algebra and Lie-infinity Homotopy Theory, Luxembourg City, Luxembourg.
- 2012 • *The Diffiety of Initial Data*,
 3rd Iberoamerican Meeting on Geometry, Mechanics and Control, Salamanca, Spain.
- *A Very General Hamilton-Jacobi Theorem*,
 The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA.

- 2011 • *Hamilton-Jacobi Diffieties*,
Folding and Unfolding: Interactions from Geometry, Ischia (NA), Italy.
- 2010 • *Hamiltonian Formalism in Higher Derivative Calculus of Variations*,
XXV International Workshop on Differential Geometric Methods in Theoretical
Mechanics, Levico Terme (TN), Italy.
- 2008 • *On the Generalization of the \mathcal{C} -Spectral Sequence to Tensors and Iterated Differential Forms*,
XXIII International Workshop on Differential Geometric Methods in Theoretical
Mechanics, Balatonföldvár, Hungary.
- 2007 • *Secondary Calculus*,
XXII International Workshop on Differential Geometric Methods in Theoretical
Mechanics, Bedlęwo, Poland.
- 2006 • *Iterated Differential Forms*,
XXI International Workshop on Differential Geometric Methods in Theoretical
Mechanics, Madrid, Spain.
- *What Really are Tensors*,
Current Geometry, Naples, Italy.
- [Contributing talks at conferences](#)
- 2020 • *Generalized Contact Bundles and Their Local Structure*,
Winter School on Geometry and Physics, Srni, Czech Republic.
- 2019 • *Homogeneous G -Structures*,
Differential Geometry and its Application, Hradec Králové, Czech Republic.
- 2017 • *Holomorphic Jacobi Manifolds*,
Geometry and Algebra of PDEs, Tromsø, Norway.
- 2015 • *Dirac-Jacobi Bundles*,
Workshop on Integrable Nonlinear Equations, Mikulov, Czech Republic.
- *Dirac-Jacobi Bundles*,
XXIV International Fall Workshop on Geometry and Physics, Zaragoza, Spain.
- *Covariant Space + Time Splitting of Field Theories via ∞ -jets*,
Variational Principles and Conservation Laws in General Relativity, Torino, Italy.
- *Deformations of Coisotropic Submanifolds of Jacobi Manifolds*,
Geometric and Algebraic Methods in Mathematical Physics, Dortmund, Germany.
- 2014 • *L_∞ -algebras from Multicontact Geometry*,
XXXIII Workshop on Geometric Methods in Physics, Białowieża, Poland.
- 2013 • *Homotopy Lie Algebroids*,
Workshop on Geometry of PDEs and Integrability, Teplice nad Bečvou, Czech
Republic.
- *Strong Homotopy Algebras in Classical Field Theory*,
Problemi Attuali di Fisica Teorica, Vietri sul Mare (SA), Italy.
- *Strong Homotopy Algebras and PDEs*,
Pseudogroups and Differential Equations, Tromsø, Norway.

- 2011 • *Hamilton-Jacobi Diffieties*,
ESF Exploratory Workshop on Current Problems in Differential Calculus over Commutative Algebras, Secondary Calculus, and Solution Singularities of Nonlinear PDEs, Vietri sul Mare (SA), Italy.
- *Multisymplectic Geometry and Infinite Jets*,
Geometry of Manifolds and Mathematical Physics, Kraków, Poland.
- 2010 • *Hamilton-Jacobi Field Theory*, Workshop on Geometry of Differential Equations and Integrability, Hradec nad Moravicí, Czech Republic.
- *Higher Derivative Lagrangian-Hamiltonian Field Theory*,
Current Geometry, Vietri sul Mare (SA), Italy.
- *C-Spectral Sequence Methods in PDEs*,
Joint SIAM/RSME-SCM-SEMA Meeting on “Emerging Topics in Dynamical Systems and Partial Differential Equations”, Barcelona, Spain.
- 2009 • *Partial Differential Hamiltonian Systems*,
Current Geometry, Vietri sul Mare (SA), Italy.
- *Partial Differential Hamiltonian Systems*,
XI International Conference Geometry, Integrability and Quantization, Varna, Bulgaria.
- *On the Geometry of the Covariant Phase Space*,
Current Geometry, Vico Equense (NA), Italy.
- 2007 • *On the Geometry of the Covariant Phase Space*,
Differential Geometry and its Applications, Olomouc, Czech Republic.
- 2006 • *Sulla Sequenza Spettrale di Leray-Serre Coomologica (On the Cohomological Leray-Serre Spectral Sequence)*,
Progressi Recenti in Geometria Reale e Complessa, Levico Terme (TN), Italy.
- *Forme Differenziali Iterate e Tensori (Iterated Differential Forms and Tensors)*,
Recenti Sviluppi della Geometria Simplettica, Differenziale, Complessa, Pisa, Italy.
- 2003 • *On the Dynamical Formation of the Dyadosphere of Black Holes*,
X Marcel Grossmann Meeting, Rio de Janeiro, Brazil.
- *Plasma Evolution Around a Collapsing Star*,
28° ICFA Advanced Beam Dynamics Workshop, Hiroshima, Japan.
- 2002 • *Collapsing Shells in General Relativity and Classical Energetics of Static Black Holes*,
X ICRA Network Workshop, Rome-Pescara, Italy.
- Other Invited talks**
- 2021 • *Multiplicative Connections on Lie Groupoids*,
Jilin University, Changchun, China (*online*).
- 2020 • *Calculus up to Homotopy on the Space of Solutions of a PDE*,
Global Poisson Webinar (*online*).
- 2019 • *Homotopy Algebras and PDEs*,
University of Napoli “Federico II”, Napoli, Italy.

- *Homogeneous G-Structures*,
Utrecht University, Utrecht, The Netherlands.
- *The Deformation L_∞ -Algebroid of a Foliation*,
University of Angers, Angers, France.
- 2018 • *Generalized Geometry In Odd Dimensions*,
Charles University, Prague, Czech Republic.
- 2017 • *The Symplectic-to-Contact Dictionary*,
Utrecht University, Utrecht, The Netherlands.
- *Multiplicative Derivations of VB Groupoids*,
Penn State University, State College (PA), USA.
- *Holomorphic Jacobi Manifolds*,
University of Firenze, Firenze, Italy.
- 2016 • *Generalized Geometry In Odd Dimensions*,
Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.
- *Homotopy Algebras and PDEs*,
UPenn, Philadelphia (PA), USA.
- *Jacobi Manifolds and Their Coisotropics*,
Penn State University, State College (PA), USA.
- 2015 • *Homotopy Algebras and PDEs*,
Sapienza University of Rome, Rome, Italy.
- 2014 • *Higher Contact Geometry and L_∞ -algebras*,
Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.
- 2013 • *Homotopy Lie-Rinehart Algebras*,
INdAM, Rome, Italy.
- 2011 • *Higher Derivative Hamiltonian Field Theory*,
Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.
- 2009 • *Covariant Phase Space and Secondary Calculus*,
• *The Lagrangian-Hamiltonian Formalism for Higher order Field Theories*
Institut de Mathématiques de Jussieu, Paris, France.

Courses at the international “Diffiety School”

- 2019 • *Differential Operators over Commutative Algebras (and the algebraic foundations of the calculus of variations)* (12 hours),
• *Infinite Jet Spaces (and the geometric foundations of the calculus of variations)* (12 hours),
XXII Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2018 • *Finite Jets and the Geometry of PDEs* (20 hours),
• *Foliations and their Cohomologies* (20 hours),
XXI Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2017 • *Integral and Cohomology* (20 hours),
• *Infinite Jets* (20 hours),
XX Diffiety School, Lizzano in Belvedere (BO), Italy.

- 2016 • *Finite Dimensional Diffieties* (22 hours),
 • *Infinite Jets* (20 hours),
 XIX Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2015 • *First Order Differential Calculus on Smooth Manifolds* (28 hours),
 • *Cohomological Theory of Integration* (26 hours),
 XVIII Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2014 • *First Order Differential Calculus on Smooth Manifolds* (18 hours),
 • *Geometry of Finite Jet Spaces* (with M. Bächtold, 18 hours),
 • *Foliations and Cohomology* (8 hours),
 XVII Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2013 • *Jets: How to Understand Partial Differential Equations* (12 hours),
 International School on Geometry of Nonlinear PDEs “Diffiety School”, Voronezh,
 Russia.
 • *Integrals and Cohomology* (24 hours),
 • *The Geometry of Finite Jet Spaces* (24 hours),
 XVI Diffiety School, Gdynia, Poland.
- 2012 • *First Order Differential Calculus on Smooth Manifolds* (24 hours),
 • *The Geometry of Infinite Jet Spaces* (24 hours),
 XV Diffiety School, Gdynia, Poland.
 • *Classical Models of the C -Spectral Sequence* (24 hours),
 XII (Winter) Diffiety School, Gdynia, Poland.
- 2011 • *Linear Connections and the Leray-Serre Spectral Sequence* (24 hours),
 XIV Diffiety School, Santo Stefano del Sole (AV), Italy.
- 2010 • *Introduction to Secondary Calculus* (24 hours),
 XIII Diffiety School, Santo Stefano del Sole (AV), Italy.
 • *Geometry of Infinite-Order Jet Spaces* (20 hours),
 X (Winter) Diffiety School, St. Petersburg, Russia.
- 2009 • *Elementary Diffieties* (24 hours),
 XII Diffiety School, Santo Stefano del Sole (AV), Italy.
 • *Geometry of Finite Jet Spaces* (12 hours),
 • *Linear Connections on Vector Bundles* (12 hours),
 IX (Winter) Diffiety School, Kostroma, Russia.
- 2008 • *Secondary Differential Forms and Vector Fields* (24 hours),
 XI Diffiety School, Santo Stefano del Sole (AV), Italy.
 • *Basic Differential Complexes and Cohomology* (20 hours),
 VIII (Winter) Diffiety School, Kostroma, Russia.
- 2007 • *Geometry of Jet Spaces and Symmetries of PDEs* (24 hours),
 X Diffiety School, Santo Stefano del Sole (AV), Italy.
 • *Introduction to Geometry of Finite Jet Spaces* (20 hours),
 VII (Winter) Diffiety School, Kostroma, Russia.
- 2006 • *Differential Cohomology* (24 hours),
 IX Diffiety School, Santo Stefano del Sole (AV), Italy.

2005 • *Differential Cohomology I* (with G. Moreno, 12 hours), VIII Diffiety School, Santo Stefano del Sole (AV), Italy.

2004 • *Differential Cohomology I* (with G. Moreno, 12 hours), VII Diffiety School, Santo Stefano del Sole (AV), Italy.

Other invited (mini-)courses

2021 • *The Symplectic-to-Contact Dictionary* (2 hours), University of La Laguna, Tenerife, Spain.

2018 • *Calculus up to Homotopy on Leaf-Spaces* (4 hours), GAAG IV, IME-USP, São Paulo, Brazil.

2017 • *Differential Geometry and PDEs* (14 hours), GIAN Initiative of the Indian Government, IIT Kanpur, Kanpur, India.

2013 • *Characteristics, Bicharacteristics, and Geometric Singularities of Solutions of PDEs* (3 hours), XXII International Fall Workshop on Geometry and Physics, Évora, Portugal.

2011 • *Covariant Phase Space* (3 hours), Workshop on Covariant Field Theory, Luxembourg City, Luxembourg.

2008 • *Geometry and Algebra of Smooth Lines (an Introduction to Conceptual 1-Dimensional Differential Calculus)* (16 hours), Voronezh State University, Voronezh, Russia.

Invited Visits

2018 Department of Mathematics, KU Leuven, Leuven, Belgium.

2018 Institute of Mathematics, Academy of Sciences of the Czech Republic, Prague, Czech Republic.

2017 Utrecht Geometry Center, University of Utrecht, Utrecht, The Netherlands.

Shapiro Visitor, Department of Mathematics, Penn State University, State College (PA), USA.

2016 Working group on *Graded Manifolds and Homotopy Algebras*, Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.

Shapiro Visitor, Department of Mathematics, Penn State University, State College (PA), USA.

2014 Working group on *Geometrical Mechanics and Field Theory*, Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.

2011 Working group on *Geometry of Mechanics*, Stefan Banach International Mathematical Center, IMPAN, Warsaw, Poland.

2009 Voronezh State University, Voronezh, Russia.

Institut de Mathématiques de Jussieu, Paris, France.

Teaching and Advising

Teaching: regular lectures

2021/2022 **Geometry II (40 hours)**, *B.Sc. in Mathematics*, Università di Salerno.

- Homology and Cohomology (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
- Elements of Higher Geometry (48 hours)**, *M.Sc. in Mathematics*, Università di Salerno.
- Mathematics II (30 hours)**, *B.Sc. in Electronic Engeneering*, Università di Salerno.
- 2020/2021 **Geometry I (8 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Geometry II (64 hours), *B.Sc. in Mathematics*, Università di Salerno.
Elements of Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
- 2019/2020 **Geometry I (24 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Geometry II (24 hours), *B.Sc. in Mathematics*, Università di Salerno.
Elements of Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
Algebra and Geometry in the Calculus of Variations (20 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2018/2019 **Geometry I (24 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Geometry II (24 hours), *B.Sc. in Mathematics*, Università di Salerno.
Elements of Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
Foliated Cohomology (20 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2017/2018 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Elements of Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
An Introduction to de Rham Cohomology (20 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2016/2017 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Differential Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
Differential Geometry and PDEs (20 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2015/2016 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
Lie Groups and Lie Algebras (24 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2014/2015 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Higher Geometry (48 hours), *M.Sc. in Mathematics*, Università di Salerno.
Symplectic Geometry and Hamiltonian Mechanics (24 hours), *Ph.D. in Mathematics, Physics and Applications*, Università di Salerno.
- 2013/2014 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Higher Geometry (48 hours), *B.Sc. in Mathematics*, Università di Salerno.

- 2012/2013 **Geometry I/II (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Mathematics I (35 hours), *B.Sc. in Engineering*, Università di Salerno.
An Introduction to Homological Algebra (18 hours), *Ph.D. in Mathematics*,
Università di Salerno.
- 2011/2012 **Geometry IV (48 hours)**, *B.Sc. in Mathematics*, Università di Salerno.
Discrete Mathematics and Mathematical Logic (48 hours), *B.Sc. in Computer
Science*, Università di Salerno.
Geometry I (24 hours), *B.Sc. in Mathematics*, Università di Salerno.
Differential Calculus over Commutative Algebras (20 hours), *Ph.D. in Math-
ematics*, Università di Salerno.
- 2010/2011 **Discrete Mathematics and Mathematical Logic (48 hours)**, *B.Sc. in Computer
Science*, Università di Salerno.
Geometry I (24 hours), *B.Sc. in Mathematics*, Università di Salerno.
- 2009/2010 **Discrete Mathematics and Mathematical Logic (48 hours)**, *B.Sc. in Computer
Science*, Università di Salerno.
Geometry I (24 hours), *B.Sc. in Mathematics*, Università di Salerno.
Geometria (24 hours), *B.Sc. in Computer Science*, Università di Salerno.
- 2008/2009 **Discrete Mathematics and Mathematical Logic (48 hours)**, *B.Sc. in Computer
Science*, Università di Salerno.
- [Advising Ph.D.](#)
- 2020-Present Ph.D. Thesis Advisor of *Gabriele Perna*, Ph.D. in Mathematics and Applications, Uni-
versità di Napoli "Federico II". Ph.D. project: *Deformations of Complex Groupoids*.
- 2018-2019 Ph.D. Thesis Advisor of *Stefano Palessandro*, Ph.D. in Mathematics, Physics and
Applications, Università di Salerno. Ph.D. project: *Vector Bundles on Higher
Differentiable Stacks*. RESIGNED.
- 2016-2019 Ph.D. Thesis Advisor of *Pier Paolo La Pastina*, Ph.D. in Mathematics, University of
Rome "La Sapienza". Thesis title: *Deformations of VB Groupoids and Algebroids*
(defended: February 2020).
- 2016-2019 Ph.D. Thesis Advisor of *Jonas Schnitzer*, Ph.D. in Mathematics, Physics and
Applications, Università di Salerno. Thesis title: *Local and Global Properties in
Jacobi Related Geometries* (defended: December 2019).
- 2013-2016 Ph.D. Thesis Advisor of *Alfonso G. Tortorella*, Ph.D. in Mathematics, University
of Florence. Thesis title: *Deformations of Coisotropic Submanifolds in Jacobi
Manifolds* (defended: March 2017).
- [Advising M.Sc.](#)
- 2021 M.Sc. Thesis Advisor of *Antonio Maglio*, M.Sc. in Mathematics, Università di
Salerno. Thesis title: *Gruppidi e Algebroidi di Lie*.
- 2020 M.Sc. Thesis Co-Advisor of *Andrea Guadagno*, M.Sc. in Mathematics, Università di
Salerno. Thesis title: *Il Teorema di De Rham*.

- M.Sc. Thesis Advisor of *Annunziata Russo*, M.Sc. in Mathematics, Università di Salerno. Thesis title: *Geometria Simplettica*.
- 2019 M.Sc. Thesis Advisor of *Maria Garofalo*, M.Sc. in Mathematics, Università di Salerno. Thesis title: *Fibrati Vettoriali e Classi Caratteristiche*.
- 2016 M.Sc. Thesis Advisor of *Pier Paolo La Pastina*, M.Sc. in Mathematics, Università di Salerno. Thesis title: *I Teoremi di Lie*.
- 2013 M.Sc. Thesis Advisor of *Alfonso G. Tortorella*, M.Sc. in Mathematics, Università di Salerno. Thesis title: *Sui Metodi Geometrici della Meccanica Hamiltoniana*.
- 2003 M.Sc. Thesis Co-Advisor of *Federico Mattei*, M.Sc. in Physics, University of Rome "La Sapienza". Thesis title: *Campi Magnetici in Collassi Gravitazionali*.

Advising B.Sc.

- 2021 B.Sc. Thesis Advisor of *Rolando Sapone*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Un'Introduzione alla Geometria Riemanniana*.
- 2020 B.Sc. Thesis Advisor of *Erica Tini Brunozzi*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *La Topologia di Zariski*.
- 2019 B.Sc. Thesis Advisor of *Antonio Maglio*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Classificazione dei Rivestimenti Topologici*.
- B.Sc. Thesis Advisor of *Girolamo Perna*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Un'Introduzione all'Omologia Singolare*.
- B.Sc. Thesis Advisor of *Generoso Martusciello*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Algebra Omologica nelle Categorie Abeliene: un'Introduzione*.
- 2018 B.Sc. Thesis Advisor of *Walter Bruno*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Il Teorema di Seifert-Van Kampen*.
- B.Sc. Thesis Advisor of *Nicola De Feo*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *G-Strutture Lineari*.
- B.Sc. Thesis Advisor of *Tommaso Peluso*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Algebra Tensoriale*.
- B.Sc. Thesis Advisor of *Irene Scaldaferrì*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Proprietà Globali delle Curve Piane*.
- B.Sc. Thesis Advisor of *Anna Turi*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Proprietà Locali delle Curve negli Spazi Euclidei*.
- 2017 B.Sc. Thesis Advisor of *Maria Garofalo*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Algebra Lineare dello Spazio-Tempo di Minkowski*.
- 2016 B.Sc. Thesis Advisor of *Federica Galdieri*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Spazi Vettoriali Simplettici*.
- 2015 B.Sc. Thesis Advisor of *Stefano Palessandro*, B.Sc. in Mathematics, Università di Salerno. Thesis title: *Teoria di Galois dei Rivestimenti*.

Administrative Service

Meeting Organizing

- 2021 • Member of the advisory committee of the International Poisson Conference.

- 2020
 - Poisson 2020 - International Conference, Napoli, Italy (CANCELLED).
 - Poisson 2020 - Summer School, Fisciano (SA), Italy (CANCELLED).
 - Diffieties, Cohomological Physics and Other Animals, Alexandre Vinogradov Memorial Conference, Moscow, Russia (Postponed).
 - INdAM Intensive Period on Poisson Geometry and Mathematical Physics, Fisciano (SA), Italy (CANCELLED).
- 2019
 - Workshop on Contact and Poisson Geometry, Timișoara, Romania.
- 2018
 - INdAM Workshop on Poisson Geometry and Higher Structures, Rome, Italy.
 - XXI Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2017
 - Micro-workshop on the Formal Theory of PDEs, Fisciano (SA), Italy.
 - XX Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2016
 - XIX Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2015
 - XVIII Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2014
 - XVII Diffiety School, Lizzano in Belvedere (BO), Italy.
- 2013
 - XVI Diffiety School, Gdynia, Poland.
- 2012
 - XV Diffiety School, Gdynia, Poland.
 - XII (Winter) Diffiety School, Gdynia, Poland.
 - ESF Follow-up Strategic Meeting, Warsaw, Poland.
- 2011
 - XIV Diffiety School S. Stefano del Sole (AV), Italy.
 - ESF Exploratory Workshop on Current Problems in Differential Calculus over Commutative Algebras, Secondary Calculus, and Solution Singularities of Nonlinear PDEs, Vietri sul Mare (SA), Italy.
 - XI (Winter) Diffiety School, St. Petersburg, Russia.
- 2010
 - XIII Diffiety School, S. Stefano del Sole (AV), Italy.
 - Inauguration of the Foundation "Istituto T. Levi-Civita", Napoli, Italy.
 - International Conference "Current Geometry", Vietri sul Mare (SA), Italy.
 - X (Winter) Diffiety School, St. Petersburg, Russia.
- 2009
 - XII Diffiety School, S. Stefano del Sole (AV), Italy.
 - International Conference "Current Geometry", Vietri sul Mare (SA), Italy.
 - IX (Winter) Diffiety School, Kostroma, Russia.
- 2008
 - XI Diffiety School, S. Stefano del Sole (AV), Italy.
 - International Conference "Current Geometry", Vico Equense (NA), Italy.
 - VIII (Winter) Diffiety School, Kostroma, Russia.
- 2007
 - X Diffiety School, S. Stefano del Sole (AV), Italy.
 - VII (Winter) Diffiety School, Kostroma, Russia.
- 2006
 - X Diffiety School, S. Stefano del Sole (AV), Italy.
 - VI (Winter) Diffiety School, Kostroma, Russia.
- 2005
 - VIII Diffiety School, S. Stefano del Sole (AV), Italy.
- 2004
 - VII Diffiety School, S. Stefano del Sole (AV), Italy.

2000 • IV Diffiety School, July 17-29, 2000, Forino (AV), Italy.

Examinations and Assessments

2021 Member of the Ph.D. reading committee of *Eugen-Mihăiță Cioroianu*, Ph.D. in Mathematics, West University of Timișoara.

2019 Member of the Ph.D. reading and defense committee of *Francesco Cattafi*, Ph.D. in Mathematics, Utrecht University.

Member of the Ph.D. reading and defense committees of *Arjen Baarsma*, Ph.D. in Mathematics, Utrecht University.

2014 Member of the Ph.D. defense committee of *Ruggero Bandiera*, Ph.D. in Mathematics, University of Rome "La Sapienza".

Project Reviewing

2020 ESI Junior Research Fellowship, Austria.

2019 NWO Veni Program, The Netherlands.

2017 FWO Fellowship Program, Belgium.

2015 MIUR "Rita Levi Montalcini" Program for young researchers, Italy.

2014 FNR PostDoc Program, Luxembourg.

Journal Editing

2021-Present *Differential Geometry and its Applications* (Elsevier).

Axioms (MDPI).

Hacettepe Journal of Mathematics and Statistics (Hacettepe University).

Journal of Nonlinear Mathematical Physics (Springer).

2019-Present *International Journal of Geometric Methods in Modern Physics* (World Scientific).

2018-Present *International Journal of Mathematics and Mathematical Sciences* (Hindawi).

2013-2017 *ISRN Geometry* (Hindawi).

Chinese Journal of Mathematics (Hindawi).

Journal Refereeing

Referee for: *Advances in Analysis (AAN)*, *Advances in Geometry*, *Advances in Mathematics*, *AIMS Proceedings*, *Annales Henri Poincaré*, *Annales Scientifiques de l'École Normale Supérieure*, *Annali di Matematica Pura e Applicata*, *Archivum Mathematicum*, *Banach Center Publications*, *Canadian Journal of Physics*, *Central European Journal of Mathematics*, *Communications in Algebra*, *European Physical Journal Plus*, *Il Nuovo Cimento B*, *IMRN*, *International Journal of Geometric Methods in Modern Physics*, *International Journal of Mathematics and Mathematical Sciences*, *International Journal of Partial Differential Equations*, *Journal of Algebra*, *Journal of Geometric Mechanics*, *Journal of Geometry and Physics*, *Journal of Lie Theory*, *Journal of Mathematical Physics*, *Journal of Nonlinear Mathematical Physics*, *Journal of Physics A: Mathematical and Theoretical*, *Journal of Symplectic Geometry*, *Mathematical Physics, Analysis and Geometry*, *Mediterranean Journal of Mathematics*, *Physics Letters A*, *Publicationes Mathematicae Debrecen*, *Qualitative Theory of Dynamical Systems*, *RACSAM*, *Reports on Mathematical Physics*, *SIGMA*, *SpringerPlus*.

Reviewer for: *MathSciNet* and *zbMATH*.

Other Academic Activities

- 2013/2014 Laboratory "*Geometria della Quarta Dimensione*" for high school students, within the National Project "Piano Lauree Scientifiche", Università di Salerno (3 meetings, 2.5 hours each).
- 2012/2013 Laboratory "*Geometria della Quarta Dimensione*" for high school students, within the National Project "Piano Lauree Scientifiche", Università di Salerno (4 meetings, 2 hours each).
- 2011/2012 Lecture for high school students: "Geometria e Algebra delle Coniche", within the National Project "Piano Lauree Scientifiche", Università di Salerno.
Laboratory "*Geometria della Quarta Dimensione*" for high school students, within the National Project "Piano Lauree Scientifiche", Università di Salerno (3 meetings, 2.5 hours each).
- 2010/2011 Lecture for high school students: "Riconoscere le Coniche", within the National Project "Piano Lauree Scientifiche", Università di Salerno.
- 2009/2010 Lecture for high school students: "Riconoscere le Coniche", within the National Project "Piano Lauree Scientifiche", Università di Salerno.