Antonio De Nicola

Curriculum Vitæ

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Contact details

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Current Position

- **Associate Professor of Geometry, Department of Mathematics, University of Salerno, Italy.**

Previous Positions

- **23 December 2016–22 December 2019: Ricercatore a tempo determinato di tipo B.**
  Tenure-track research position at the Department of Mathematics of the University of Salerno, Italy.
- **31 December 2013–22 December 2016: Investigador FCT.**
  5 years research position as *Investigador Auxiliar* at CMUC (Centre for Mathematics of the University of Coimbra), Portugal.
- **1 August 2009– 30 December 2013: Ciência 2008 Researcher.**
  5 years research position as *Investigador Auxiliar* at CMUC (Centre for Mathematics of the University of Coimbra), Portugal.
- **January 2009–July 2009**: **Juan de la Cierva Researcher.**
  Postdoctoral research position (up to 3 years) at the Department of Fundamental Mathematics of the University of La Laguna, San Cristóbal de La Laguna, Tenerife, Spain.
- **September 2007–December 2008: CMUC Postdoctoral Researcher.**
  Postdoctoral research position at CMUC (Centre for Mathematics of the University of Coimbra), Portugal.

Academic Degrees and qualifications

- **November 11, 2020: Italian National Scientific Qualification as Full Professor in Geometry and Algebra.**
  Abilitazione Scientifica Nazionale (ASN) alle funzioni di Professore universitario di prima fascia (ASN 2018 - V Q, Settore conc. 01/A2, validità 11.11.2020–11.11.2029).
- **March 28, 2017: Italian National Scientific Qualification as Associate Professor in Geometry and Algebra.**
  Abilitazione Scientifica Nazionale (ASN) alle funzioni di Professore universitario di seconda fascia (ASN 2016 - I Q, Settore conc. 01/A2, validità 28.3.2017–28.3.2023).
- **May 23, 2006: Ph.D. in Mathematics, University of Bari, Italy.**
  Curriculum in Geometry and Algebra. Dissertation Title: *Geometric Foundations of Classical Field Theory*.
  Thesis advisor: Prof. Włodzimierz M. Tulczyjew (University of Camerino, Italy).

- **March 14, 2001: Laurea degree (equivalent to M.Sc.) in Physics, University of Naples "Federico II"**
  Final Rank: 110/110 *cum laude* (Italian highest honors). Curriculum in Mathematical Physics. Dissertation Title: *A geometric study of Euler-Lagrange and Hamilton-Dirac equations* (italian).
  Thesis Supervisor: Prof. Renato Grassini.

TEACHING EXPERIENCE

- **October–December 2020: Course of Riemannian Geometry at the University of Salerno.**
  I taught a course on Riemannian geometry (48 hours) to second year Master students of the University of Salerno.
- **February–May 2020: Course of Geometry at the University of Salerno.**
  I taught the second part of the course of Geometry and linear algebra (32 hours) to first year students of Physics of the University of Salerno.
- **October–December 2019: Course of Riemannian Geometry at the University of Salerno.**
  I taught a course on Riemannian geometry (48 hours) to second year Master students of the University of Salerno.
- **February–May 2019: Course of Geometry at the University of Salerno.**
  I taught the second part of the course of Geometry and linear algebra (32 hours) to first year students of Physics of the University of Salerno.
- **October 2018–January 2019: Course of Riemannian Geometry at the University of Salerno.**
  I taught a course on Riemannian geometry (48 hours) to second year Master students of the University of Salerno.
- **February–May 2018: Course of Geometry at the University of Salerno.**
  I taught the second part of the course of Geometry and linear algebra (32 hours) to first year students of Physics of the University of Salerno.
- **October 2017–January 2018: Course of Differential Geometry at the University of Salerno.**
  I taught a course on Differentiable Manifolds (48 hours) to second year Master students of the University of Salerno.
- **February–May 2017: Course of Geometry at the University of Salerno.**
  I taught the second part of the course of Geometry and linear algebra (32 hours) to first year students of Physics of the University of Salerno.
- **September 2016–December 2016: Course of Differentiable Manifolds at the University of Coimbra.**
  I taught the course of Differentiable Manifolds (50 hours) to first year PhD students enrolled in the joint PhD program of the Universities of Coimbra and Porto, Portugal.
- **September 2014–January 2015: Exercise classes of Geometry and Linear Algebra (ALGA) at the University of Coimbra.**
  I taught the Exercise classes (Theoretical-Practical) of a one-semester course (24 hours) in Geometry and Linear Algebra to over 30 first year students of Mechanical Engineering of the FCTUC, University of Coimbra.
- **February–May 2014: Exercise classes of Geometry and Linear Algebra (ALGA) at the University of Coimbra.**
  I taught the Exercise classes (Theoretical-Practical) of a one-semester course (19.5 hours) in Geometry and Linear Algebra to over 40 first year students of Environmental Engineering of the FCTUC, University of Coimbra.
- **September 2012–January 2013: Exercise classes of Geometry and Linear Algebra (ALGA) at the University of Coimbra.**
  I taught the Exercise classes (Theoretical-Practical) of a one-semester course (30 hours) in Geometry and Linear Algebra to over 60 first year students of Physics of the FCTUC, University of Coimbra.
- **26 May–9 June 2012: Invited minicourse in Symplectic and Poisson Geometry at the University of Ouargla, Algeria.**
  I gave a minicourse (14 hours) of introduction to Symplectic and Poisson Geometry in the Première École de Géométrie, on invitation by the Rector of the Université Kasdi Merbah Ouargla. The invitation was aimed to improve the research level of new and not new local researchers and to give advice for the reorganization and the renewal of the undergraduate and Master's courses.
- **October 2006–February 2007: Exercise classes of Geometry, Polytechnic University of Bari, Italy.**
  Just after obtaining my PhD, I was contracted to teach exercise classes of a one-semester course (20 hours) in Geometry and Linear Algebra to over one hundred first year civil engineering students of the Polytechnic of Bari, Italy.

SELECTED PUBLICATIONS

[S1] B. Cappelletti-Montano, A. De Nicola, I. Yudin, *Hard Lefschetz theorem for Sasakian manifolds*, **Journal of Differential Geometry** 101 (2015), 47–66.

In this paper we establish the Hard Lefschetz Theorem for any compact Sasakian manifold. It provides an obstruction for a contact manifold to admit a Sasakian metric compatible with the contact structure. We introduce contact-Lefschetz manifolds and extended to them the result of Fujitani stating that the odd Betti number of a compact Sasakian manifold are even. Examples of Lefschetz manifolds with no Sasakian structure have been recently presented by Y. Lin. In the paper [13] of the Complete List of Publications, we use the above mentioned obstruction to exhibit examples of compact K-contact non-Sasakian manifolds.

This paper was published in the Journal of Differential Geometry which is considered to be the best journal in geometry and one of the top mathematical journals. Currently, it is ranked at 13th place among all mathematical journals according to MCQ citation index of the American Mathematical Society.

[S2] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Sasakian nilmanifolds*, **International Mathematics Research Notices** Vol. 2015, no. 15, 6648–6660.

This paper solves an important problem: which compact nilmanifolds of odd dimension admit Sasakian structure. In the even-dimensional case, the problem of classifying compact nilmanifolds with Kähler structure was solved independently by Hasegawa and Benson-Gordon. Notice that we attack the problem in its full generality, and do not require invariance of the Sasakian structure or any other kind of compatibility. Essentially, the proofs consists in comparing two models for a Sasakian nilmanifold by means of a morphism which is known to exist between them. One of the models was found by Hasegawa (it applies to any compact nilmanifold and it is minimal in the sense of Sullivan) and the other one was found by Tievski in his thesis (and applies to compact Sasakian manifolds, using their basic cohomology). Carefully analyzing the consequences of the existence of the said morphism, we are able to prove that the Lie algebra of the nilpotent group is 2-step nilpotent. Then by looking at the classification of these Lie algebras, we conclude that it must be the generalized Heisenberg Lie algebra.

[S3] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Hard Lefschetz theorem for Vaisman manifolds*. **Transactions of the American Mathematical Society** 371 (2019), 755–776.

We establish a Hard Lefschetz Theorem for the de Rham cohomology of compact Vaisman manifolds. A similar result is proved for the basic cohomology with respect to the Lee vector field. Motivated by these results, we introduce the notions of a Lefschetz and of a basic Lefschetz locally conformal symplectic (l.c.s.) manifold of the first kind. We prove that the two notions are equivalent if there exists a Riemannian metric such that the Lee vector field is unitary and parallel and its metric dual 1-form coincides with the Lee 1-form. Finally, we discuss several examples of compact l.c.s. manifolds of the first kind which do not admit compatible Vaisman metrics.

[S4] B. Cappelletti-Montano, A. De Nicola, I. Yudin, *A survey on cosymplectic geometry*, **Reviews in Mathematical Physics** 25 (2013), 1343002 (55 pages).

In this paper we give an up-to-date overview of geometric and topological properties of cosymplectic and coKähler manifolds. We cover a period of 40 years of results published in this modern field of research. We also describe some of the applications to time-dependent mechanics.

This paper has had a considerable impact in the field, rapidly becoming the main reference for the researchers in cosymplectic geometry, as shown by the 47 citations it has already collected, according to Google Scholar (October 2018).

[S5] B. Cappelletti Montano, A. De Nicola, I. Yudin *Topology of 3-cosymplectic manifolds*, **The Quarterly Journal of Mathematics** 64 (2013), 59–82.

We study the topology of 3-cosymplectic manifolds. We show that there is an action of the Lie algebra $so(4,1)$ on the basic cohomology spaces of a compact 3-cosymplectic manifold with respect to the Reeb foliation. This implies some topological obstructions to the existence of such structures which is expressed by bounds on the Betti numbers. It is known that every 3-cosymplectic manifold is a local Riemannian product of a hyper-Kähler factor and an abelian three dimensional Lie group. Nevertheless, we present a nontrivial example of compact 3-cosymplectic manifold which is not the global product of a hyper-Kähler manifold and a flat 3-torus.

FULL LIST OF PUBLICATIONS

[1] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Almost formality of quasi-Sasakian and Vaisman manifolds with applications to nilmanifolds*, Israel Journal of Mathematics **241** (2021), 37–87.

[2] B. Cappelletti-Montano, A. De Nicola, G. Dileo, I. Yudin, *Nearly Sasakian manifolds revisited*, Complex Manifolds **6** (2019), 320–334. DOI:10.1515/coma-2019-0017.

[3] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Hard Lefschetz theorem for Vaisman manifolds*. Transactions of the American Mathematical Society **371** (2019), 755–776.

[4] A. De Nicola, G. Dileo, I. Yudin, *On nearly Sasakian and nearly cosymplectic manifolds*, Annali di Matematica Pura ed Applicata **197** (2018), 127–138.

[5] A. De Nicola, C. Esposito, *Reduction of pre-Hamiltonian actions*, Journal of Geometry and Physics **115** (2017), 178–190.

[6] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *A non-Sasakian Lefschetz K-contact manifold of Tievsky type*. Proceedings of the American Mathematical Society **144** (2016), 5341–5350.

[7] A. De Nicola, I. Yudin, *Generalized Goldberg Formula*, Canadian Mathematical Bulletin **59** (2016), 508–520.

[8] B. Cappelletti-Montano, A. De Nicola, I. Yudin, *Cosymplectic p-spheres*, Journal of Geometry and Physics **100** (2016), 68–79.

[9] B. Cappelletti-Montano, A. De Nicola, I. Yudin, *Hard Lefschetz theorem for Sasakian manifolds*, Journal of Differential Geometry **101** (2015), 47–66.

[10] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Sasakian nilmanifolds*, International Mathematics Research Notices **2015**, no. 15, 6648–6660.

[11] B. Cappelletti-Montano, A. De Nicola, I. Yudin, *Examples of* 3*-quasi-Sasakian manifolds*. Rendiconti del Seminario Matematico — Università e Politecnico di Torino **73/1** (2015), 51–61

[12] A. De Nicola, I. Yudin, *Covariant Lie derivatives and Frölicher-Nijenhuis bracket on Lie Algebroids*, Int. J. Geom. Methods Mod. Phys. **12** (2015), no. 9, 1560018, 8 pages.

[13] B. Cappelletti-Montano, A. De Nicola, J.C. Marrero, I. Yudin, *Examples of compact K-contact manifolds with no Sasakian metric*, Int. J. Geom. Methods Mod. Phys. **11** (2014), 1460028 (10 pages).

[14] B. Cappelletti Montano, A. De Nicola, I. Yudin, *A survey on cosymplectic geometry*, Reviews in Mathematical Physics **25** (2013), 1343002 (55 pages).

[15] B. Cappelletti Montano, A. De Nicola, I. Yudin, *Topology of* 3*-cosymplectic manifolds*, The Quarterly Journal of Mathematics **64** (2013), 59–82.

[16] B. Cappelletti Montano, A. De Nicola, I. Yudin, *Curvature properties of 3-quasi-Sasakian manifolds*, Int. J. Geom. Methods Mod. Phys. **10** (2013), 1360008 (9 pages).

[17] B. Cappelletti Montano, A. De Nicola, I. Yudin *Some Remarks on cosymplectic* 3*-structures*, XX International Fall Workshop on Geometry and Physics, AIP Conference Proceedings **1460** (2012), 141–146.

[18] A. De Nicola, J.C. Marrero, E. Padron, *Reduction of Poisson-Nijenhuis Lie algebroids to symplectic-Nijenhuis Lie algebroids with nondegenerate Nijenhuis tensor*, Journal of Physics A: Mathematical and Theoretical **44** (2011), 425206 (35 pages).

[19] R. Caseiro, A. De Nicola, J. M. Nunes da Costa, *On Jacobi quasi-Nijenhuis algebroids and Courant-Jacobi algebroid morphisms*, Journal of Geometry and Physics **60** (2010), 951–961.

[20] B. Cappelletti Montano, A. De Nicola, G. Dileo, *The geometry of* 3*-quasi-Sasakian manifolds*, International Journal of Mathematics **20** (2009), 1081–1105.

[21] B. Cappelletti Montano, A. De Nicola, G. Dileo, *Erratum:* 3*-quasi-Sasakian manifolds*, Ann. Glob. Anal. and Geom. **35** (2009), 445–448.

[22] A. De Nicola, W. M. Tulczyjew, *A Variational Formulation of Electrodynamics with External Sources*, Int. J. Geom. Methods Mod. Phys. **6** (2009), 173–200.

[23] B. Cappelletti Montano, A. De Nicola, G. Dileo, 3*-quasi-Sasakian manifolds*, Annals of Global Analysis and Geometry **33** (2008), 397–409.

[24] B. Cappelletti Montano, A. De Nicola, G. Dileo, *A Note on* 3*-quasi-Sasakian Geometry*, in Geometry and Physics: XVI International Fall Workshop, R. L. Fernandes and R. Picken (eds.), AIP Conference Proceedings **1023** (2008), 132–137.

[25] B. Cappelletti Montano, A. De Nicola, 3-*Sasakian manifolds*, 3-*cosymplectic manifolds and Darboux theorem*, Journal of Geometry and Physics, **57** (2007), 2509–2520. [ISI IF2014: 0.870].

[26] A. De Nicola, *Formulazione geometrica dei principi variazionali in teoria classica del campo*, Bollettino della Unione Matematica Italiana A 10 (2007), 219–222.

[27] A. De Nicola, W. M. Tulczyjew, *A Note on a Variational Formulation of Electrodynamics*, Proc. XV Int. Workshop on Geom. and Phys., Tenerife (Spain), 2006, Publ. de la RSME **11** (2007), 316–323.

[28] A. De Nicola, W. M. Tulczyjew, *A Variational Formulation of Analytical Mechanics in an Affine Space*, Reports on Mathematical Physics, **58** (2006), 335–350.

OLDER PREPRINTS

[Pre1] R. Caseiro, A. De Nicola, J. M. Nunes da Costa, *On Poisson quasi-Nijenhuis Lie algebroids*, 2008, 12 pages [arXiv:0806.2467].

PHD THESIS

[PhD] A. De Nicola, *Geometric Foundations of Classical Field Theory*, PhD Thesis, University of Bari, Italy, 2006, available at the National Libraries of Rome and Florence.

SUMMARY OF PAST RESEARCH ACTIVITY

- Keywords: Riemannian geometry, Topological invariants, Sasakian Geometry, Poisson geometry, Mathematical Physics.

My scientific activity has been developed around a few topics all concerning Differential Geometry and its interactions with Mathematical Physics. Most of my scientific production concerns Topology and Geometry of Sasakian and coKählerian manifolds, and their quaternionic counterparts. I also dealt with Poisson and Jacobi manifolds and algebroids.

The first topic in which I worked is the geometric formulation of classical field theory and led to the Ph.D. thesis [PhD], supervised by Prof. W. M. Tulczyjew. In the thesis we considered the principle of virtual work, well known in statics, as a master model for all variational principles of classical physics. Thus we started with a reformulation of statics and dynamics of mechanical systems in a form suitable for generalization to field theories. Some of the results obtained in the first part of the thesis were published in [28]. We used the results obtained in statics and dynamics as a conceptual guide for developing a variational formulation of electrodynamics as an important example of field theory. Relying on a variational principle more complete than the Hamilton principle our formulation led to field equations with external sources and permitted the derivation of the constitutive relations which were usually postulated. The main results obtained in the second part of thesis were announced in [27]. The complete formulation was presented in the paper [22].

After the Ph.D., a new line of research gradually emerged, focused on the study of contact metric (Sasakian) manifolds, as well as Jacobi and Poisson manifolds, and the associated algebroids.

In [25] we present a compared analysis of some properties of 3-Sasakian and 3-cosymplectic manifolds which are the closest odd-dimensional analogue of hyper-Kähler structures. These manifolds have assumed great importance in Physics in view of their recently found applications to supergravity and superstring theory. We prove that a 3-Sasakian manifold does not admit any Darboux-like coordinate system. Moreover, we prove that any 3-cosymplectic manifold is Ricci-flat and in the regular case it projects onto a Hyper-Kähler manifold. The similarities found in the two classes studied led subsequently to a systematic analysis of the larger class given by the 3-quasi-Sasakian manifolds [23, 20]. In particular we prove that the three Reeb vector fields determine a totally geodesic and Riemannian foliation. We show that 3-quasi-Sasakian manifolds have a well-defined rank, obtaining a rank-based classification. Finally, we study their relation with Quaternionic-Kähler and hyper-Kähler manifolds. Recently, in collaboration with I. Yudin (University of Coimbra) and B. Cappelletti Montano (University of Cagliari), we studied the topology of 3-cosymplectic manifolds (see [S4, S5, 17]). We show that there is an action of the Lie algebra $so(4,1)$ on the basic cohomology spaces of a compact 3-cosymplectic manifold with respect to the Reeb foliation. This implies some topological obstructions to the existence of such structures which is expressed by bounds on the Betti numbers. It is known that every 3-cosymplectic manifold is a local Riemannian product of a hyper-Kähler factor and an abelian three dimensional Lie group. Nevertheless, we present a nontrivial example of compact 3-cosymplectic manifold which is not the global product of a hyper-Kähler manifold and a flat 3-torus.

Recently, in [9] we established the Hard Lefschetz Theorem for Sasakian manifolds. It provides an obstruction for a compact contact manifold to admit a Sasakian metric compatible with the contact structure. We introduced contact Lefschetz manifolds and extended to them the result of Fujitani stating that the odd Betti number of a compact Sasakian manifold are even. Examples of Lefschetz manifolds with no Sasakian structure have been recently presented by Y. Lin. In [13], we used this obstruction to exhibit examples of compact K-contact non-Sasakian manifolds.

One of the most powerful tools to study topological invariants of manifolds is provided by Rational and Real Homotopy Theory developed by Sullivan in the 70s. It is well known that the de Rham algebra of the manifold contains a lot of information, but it is not manageable since the spaces of differential forms are infinite dimensional. As an obvious remedy one can pass to cohomology groups of the de Rham algebra, but in this way too much information is lost. Real Homotopy Theory gives an intermediate object between the full de Rham algebra and its cohomology. Namely, one defines a model of a manifold as a commutative differential graded algebra (CDGA) quasi-isomorphic to the de Rham algebra. In this way the cohomology groups of the model are the same as the de Rham cohomology groups of the manifold. But on the other hand one can often find a finite-dimensional model. For example, in Sullivan and his collaborators showed that cohomology ring of a Kaehler manifold is its model. The strength of this result was demonstrated by Hasegawa that showed that every Kaehler nilmanifold, that is a quotient of a nilpotent Lie group by a cocompact subgroup, is an even dimensional torus. In contrast to the Kaehler case, the cohomology ring of a Sasakian manifold is not its model in general. However Tievsky in his PhD thesis constructed a finite dimensional model of a Sasakian manifold starting from its basic cohomology ring. Using his model, we gave a complete classification of Sasakian nilmanifolds in [S2]. Based on this result, Kasuya recently managed to classify Sasakian solvmanifolds.

On the Poisson side, my research mainly concerns with Lie algebroids, Courant algebroids and Dirac structures. Among the results already achieved, it is worth to mention the generalization of the notion of Poisson quasi-Nijenhuis structure to Lie algebroids [Pre1] showing that they give rise to quasi-Lie bialgebroids. This opened the ground to the possibility of considering also the concept of a Jacobi quasi-Nijenhuis manifold which we expected to give rise to a quasi-Jacobi bialgebroid. This has been proven in [19], in collaboration with J. Nunes da Costa e R. Caseiro of CMUC. We also obtained an associated Courant-Jacobi algebroid to each Jacobi quasi-Nijenhuis manifold or algebroid. The notions of quasi-Jacobi bialgebroid morphism and Courant-Jacobi algebroid morphism were introduced, providing also some examples. In collaboration with J. C. Marrero and E. Padrón of the University of La Laguna, I studied bi-Hamiltonian systems in the framework of Lie Algebroids and the related geometric problems like the reduction of Poisson Nijenhuis Lie Algebroids. We showed how to reduce, under certain regularities conditions, a Poisson-Nijenhuis Lie algebroid to a symplectic-Nijenhuis Lie algebroid with a nondegenerate Nijenhuis tensor. We generalized the work done by Magri and Morosi for the reduction of Poisson-Nijenhuis manifolds. The choice of the more general framework of Lie algebroids was motivated by the geometric study of some reduced bi-Hamiltonian systems. An explicit example of reduction of a Poisson-Nijenhuis Lie algebroid was also provided. This research resulted in the publication [18].

Talks and Seminars

Invited Talks

1. Driebergen (The Netherlands), 4 October 2017, International Workshop "Lie Pseudogroups: Old and New". **Invited Talk:** *Almost formality of Vaisman manifolds with applications to nilmanifolds.*

2. Braga (Portugal), 27 November 2013, Geometry and Topology Day. **Invited Talk:** *Hard Lefschetz theorem for Sasakian manifolds.*

3. Oporto (Portugal), 15 May 2010, Centre for Mathematics of the University of Oporto (CMUP). Poisson@PT Meeting. **Invited Talk:** *Reduction of Poisson-Nijenhuis Lie algebroids.*

4. Zaragoza, (Spain), 27 January 2009, XI Encuentro de Invierno: Geometría, Mecánica y Teoría de Control. **Invited Talk:** *On Poisson quasi-Nijenhuis Lie algebroids.*

5. Coimbra (Portugal), 28 June 2008, ENSPM'08. **Invited Talk:** *The Geometry of 3-quasi-Sasakian Manifolds.*

Contributed Talks

1. Braga (Portugal), 6 September 2017, XXVI International Fall Workshop on Geometry and Physics. Contributed Talk: *Models for quasi-Sasakian and quasi-Vaisman manifolds and classification of their nilmanifolds.*

2. Bedlewo (Poland), 19 October 2015, Workshop on almost Hermitian and contact geometry. Contributed Talk: *Hard Lefschetz theorem for Vaisman manifolds.*

3. Zaragoza (Spain), 3 September 2015, XXIV International Fall Workshop on Geometry and Physics. Contributed Talk: *Hard Lefschetz theorem for Vaisman manifolds.*

4. Oporto (Portugal), 10 June 2015, AMS-EMS-SPM International Meeting. Contributed Talk: *Hard Lefschetz theorem for Vaisman manifolds.*

5. Évora (Portugal), 2 September 2013, XXII International Fall Workshop on Geometry and Physics. Contributed Talk: *Hard Lefschetz theorem for Sasakian manifolds.*

6. Olhão (Portugal), 6 September 2012, Quantum Integrable Systems and Geometry conference. Contributed Talk: *Topology of 3-quasi-Sasakian Manifolds.*

7. Madrid (Spain), 1 September 2011, XX International Fall Workshop on Geometry and Physics. Contributed Talk: *Topology of 3-cosymplectic manifolds.*

8. Krakow (Poland), 27 June 2011, Geometry of Manifolds and Mathematical Physics. Contributed Talk: *Reduction of Poisson-Nijenhuis Lie algebroids.*

9. Neuchâtel (Switzerland), 4 May 2011, Second Workshop on CR, pseudo-Hermitian and Sasakian Geometry. Contributed Talk: *Topology of 3-cosymplectic manifolds.*

10. Tenerife (Spain), 10 December 2010, 5th International Young Researchers Workshop on Geometry, Mechanics and Control. Contributed Talk: *Topology of 3-cosymplectic manifolds.*

11. Ghent (Belgium), 12 January 2010, 4th International Young Researchers Workshop on Geometry, Mechanics and Control. Contributed Talk: *On Jacobi quasi-Nijenhuis algebroids and Courant-Jacobi algebroid morphisms.*

12. Benasque (Spain), 9 September 2009, XVIII International Fall Workshop on Geometry and Physics. Contributed Talk: *Reduction of Poisson-Nijenhuis Lie algebroids.*

13. Lisbon (Portugal), 5 September 2007, XVI International Fall Workshop on Geometry and Physics. Contributed Talk: *3-quasi-Sasakian Manifolds.*

POSTER PRESENTATIONS

1. Bari (Italy), 26 June 2015, Geometric Structures on Riemannian Manifolds. Poster Presentation: *Hard Lefschetz theorem for Vaisman manifolds.*

2. Bedlewo (Poland), 12–14 May 2015, Geometry of Jets and Fields. Poster Presentation: *Geometry and topology of cosymplectic spheres.*

3. Granada (Spain), 2 September 2014, XXIII International Fall Workshop on Geometry and Physics. Poster Presentation: *Cosymplectic p-spheres*.

4. Madrid (Spain), 2 September 2014, deLeónfest, ICMAT, Madrid. Poster Presentation: *Sasakian Hard Lefschetz theorem*.

5. Urbana-Champaign (USA), 5 August 2014, Poisson 2014 conference, University of Illinois at Urbana-Champaign Poster Presentation: *Cosymplectic p-spheres*.

6. Burgos (Spain), 30 August 2012, XXI International Fall Workshop on Geometry and Physics. Poster Presentation: *Topology of 3-quasi-Sasakian Manifolds.*

7. Rio de Janeiro (Brazil), 29 July 2010, IMPA, Poisson 2010 conference. Poster Presentation: *Reduction of Poisson-Nijenhuis Lie algebroids.*

8. Lausanne (Switzerland), 14 July 2008, Poisson 2008 conference. Poster presentation: *On Poisson quasi-Nijenhuis Lie algebroids.*

9. Lecce (Italy), 15 June 2007, Conference: Recent advances in Differential Geometry. Poster presentation: *3-quasi-Sasakian Manifolds.*

10. Tenerife (Spain), 12 September 2006, XV International Workshop on Geometry and Physics. Poster presentation: *A Variational Formulation of Electrodynamics.*

INVITED SEMINARS

1. Utrecht (The Netherlands), 4 October 2017, Utrecht University. *Friday Fish seminar*. **Invited Seminar:** Hard Lefschetz Theorem for Sasakian manifolds.
2. Oporto (Portugal), 27 November 2015, Universidade do Porto. Geometry and Topology seminar. **Invited Seminar:** *Hard Lefschetz theorem for Vaisman manifolds.*
3. Marburg (Germany), 2 June 2015, Philipps-Universität Marburg, **Invited Seminar:** *Sasakian nilmanifolds.*
4. Lisbon (Portugal), 28 April 2015, Instituto Superior Tecnico, Geometria em Lisboa. **Invited Seminar:** *Hard Lefschetz theorem for Sasakian manifolds.*
5. Würzburg (Germany), 26 February 2015. Department of Mathematics, University of Würzburg. **Invited Seminar:** *Sasakian nilmanifolds.*
6. La Laguna, Tenerife (Spain), 28 March 2014. Department of Fundamental Mathematics and Statistics, University of La Laguna. **Invited Seminar:** *Hard Lefschetz theorem for Sasakian manifolds.*
7. Murcia (Spain), 15 January 2014. Department of Mathematics, University of Murcia. **Invited Seminar:** *Hard Lefschetz theorem for Sasakian manifolds.*
8. Lisbon (Portugal), 30 October 2012, Instituto Superior Tecnico, Geometria em Lisboa. **Invited Seminar:** *Geometry and Topology of 3-quasi-Sasakian manifolds.*
9. Bari (Italy), 21 December 2009, Department of Mathematics, University of Bari. **Invited Seminar:** *Riduzione di algebroidi di Poisson-Nijenhuis.*

OTHER SEMINARS

1. Coimbra (Portugal), 19 February 2015, Centre for Mathematics of the University of Coimbra, CMUC Geometry Seminar: *Sasakian nilmanifolds.*
2. Coimbra (Portugal), 19 April 2013, Centre for Mathematics of the University of Coimbra, CMUC Workshop. Seminar: *Geometry and Topology of quasi-Sasakian manifolds.*
3. Coimbra (Portugal), 15 February 2012, Centre for Mathematics of the University of Coimbra (CMUC). Seminar: *Geometry and Topology of 3-cosymplectic manifolds.*
4. Coimbra (Portugal), 20 October 2010, Centre for Mathematics of the University of Coimbra (CMUC). Seminar: *An Introduction to Contact Geometry.*
5. Coimbra (Portugal), 23 March 2009, Centre for Mathematics of the University of Coimbra (CMUC). Seminar: *A decomposition theorem for 3-quasi-Sasakian Manifolds.*
6. Coimbra (Portugal), 2 December 2008, Centre for Mathematics of the University of Coimbra (CMUC). Seminar: *On Poisson quasi-Nijenhuis Lie algebroids.*
7. Coimbra (Portugal), 19 October 2007, Centre for Mathematics of the University of Coimbra (CMUC). Seminar: *The Geometry of 3-quasi-Sasakian Manifolds.*
8. Bari (Italy), 8 November 2005, Department of Mathematics, University of Bari, Italy. Seminar: *Geometric Formulation of Electrodynamics.*
9. Bari (Italy), 27 September 2005, Department of Mathematics, University of Bari, Italy. Seminar: *Geometric Formulation of Classical Field Theory*.

FUNDING INFORMATION: RESEARCH GRANTS

- **Visiting Scientist** at the University of Cagliari, Italy. **Principal Investigator** of the Research Project: *Topology of transversely Kahler manifolds*. I won a competitive grant of the University of Cagliari for joint research projects with local researchers, financed by *Regione Sardegna* and reserved to researchers working outside Italy (8–23 September 2016).
- Member of the Spanish Research Project *Mecánica Geométrica y estructuras relacionadas* (2016–2019), **MTM2015-64166-C2-2-P** (3 years grant, 16.100 EUR).
- Member of the Spanish Research Project *Mecánica Geométrica, Teorias Clasicas De Campos Y Estructuras De Poisson* (2013–2016), **MTM2012-34478** (3 years grant for 10 team members, 28.665 EUR).

- Grant of the Portuguese FCT awarded to the geometry group of the Universidade de Coimbra *Algebróides, Geometria, Grupos Quânticos e Aplicações* (2011–2013), **PTDC/MAT/099880/2008** (3 years grant for 17 team members, 90.000 EUR).
- Member of the Spanish Research Project *Geometría, Mecánica Y Control* (2012–2013), **MTM2011-15725-E**, 15.000 EUR).
- Member of the Spanish Research Project *Geometría, Mecánica Y Control* (2011–2012), **MTM2010-12116-E**, 15.000 EUR).
- Member of the Spanish Research Project *Geometría, Mecánica Y Teorias Clasicas De Campos. Algunos Problemas Variacionales* (2010–2012), **MTM2009-13383** (3 years grant for 7 team members, 49.489 EUR).
- Member of the Spanish Research Project *Geometría, Mecánica Y Control* (2010–2011), **MTM2009-08166-E**, 20.000 EUR).

PROFESSIONAL MEMBERSHIPS, AWARDS AND HONORS

- Faculty member of the PhD program in Mathematics and Physics of the University of Salerno (2019–present)
- Referee of Research projects for postdoctoral applications for *the Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO)* (2018).
- Faculty member of the joint PhD program of the Universities of Coimbra and Porto, Portugal. (2010–2016)
  As a faculty, I adviced PhD students in their Research and I gave periodical introductory seminars on selected research topics aimed to PhD students.
- Referee for several international mathematical journals including
  - *Bulletin of the London Mathematical Society*
  - *Illinois Journal of Mathematics*
  - *Journal of Geometry and Physics*
  - *Journal of Geometric Mechanics*
  - *Journal of Topology*
  - *Mediterranean Journal of Mathematics*.
- Qualified for the position of *Maître de conférences* in French universities (2013, N. de qualification 13225244133) (2013).
- Member of the GMC Research Network (Geometry, Mechanics and Control) (2009–present).
- Reviewer for *Mathematical Reviews* (2006–present).
- Reviewer for *ZentralBlatt Math* (2010–present).
- Member of the Organizing Committee of the international conference *Poisson 2020* (postponed to 2021), Salerno-Napoli, Italy.
- Member of the Organizing Committee of the workshop *Contact and Poisson Geometry*, Timişoara, Romania, October 31–November 2, 2019.
- Member of the Organizing Committee of the workshop *Micro-Workshop on the Formal Theory of PDEs*, Salerno, Italy, November 6–10, 2017.
- Main Organizer of the *6th International Young Researchers Workshop on Geometry, Mechanics and Control*, Coimbra, 10–13 January 2012.
- Member of the Organizing Committee of the *Poisson Geometry and Application* conference, Figueira da Foz, Portugal, 13–16 June 2011.
- Organizer of the CMUC monthly seminars in Geometry (2012–2016).

Language Skills

- Italian: Mother tongue.
- English: Fluent.
- Portuguese: Fluent.
- Spanish: Good.

Computer Skills

- Programming Languages: C, Fortran 77, SQL, shell scripting, HTML.
- Operating systems: Linux/Unix, Mac os and Windows.
- Software: TEX/LATEX, Matlab, Maple, MS Office.