Viviana del Barco

CONTACT INFORMATION

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EDUCATION

28/03/2012 – **Doctorate in Mathematics** Universidad Nacional de Rosario, Argentina
Thesis: *An approximation to the study of nilmanifolds. Cohomology and its applications.*
Advisor: Isabel Dotti. Second Advisor: Gabriela Ovando.

27/03/2007 – **Bachelor degree in Mathematics** Universidad Nacional de Rosario, Argentina.
Thesis: *On the geometry of Lie groups endowed with bi-invariant metrics*
Advisor: Gabriela Ovando.
Degree: Licenciada en Matemática.

RESEARCH AND TEACHING POSITIONS

Current position

Since 08/02/2021 – **Professora Doutora** Universidade Estadual de Campinas (UNICAMP).

Previous positions

01/06/2015 - 19/07/2021- **Assistant Researcher** Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina.
01/03/2014 - 01/03/2016– **Adjoint Professor** Universidad Nacional de Rosario, Argentina.

01/10/2019 - 30/11/2020 – **Teaching assistant** (ATER) Université Paris-Saclay.

01/05/2016 - 30/04/2019 – **Post-doctoral researcher** at Universidade Estadual de Campinas, Brazil.

01/12/2017 - 30/11/2018 – **Post-doctoral internship abroad** Université Paris Sud, France.

01/04/2012 - 31/03/2014 – **Post-doctoral researcher** Universidad Nacional de Rosario, Argentina.

01/08/2005 - 28/02/2014 – **Teaching assistant** Universidad Nacional de Rosario, Argentina.

FRENCH QUALIFICATION

02/2020 - 12/2024 – French Qualification Maître de Conférences: 20225322905. Section 25 – Mathematics.

ITALIAN QUALIFICATION

05/2021 - 05/2030 – Italian Abilitazione Scientifica Nazionale, settore concorsuale 01/A2, fascia II.

PUBLICATIONS IN INTERNATIONAL JOURNALS

1. V. del Barco and A. Moroianu. "Conformal Killing forms on 2-step nilpotent Riemannian Lie groups". *To appear in Forum Math.* (2021) arXiv:2101.08622
2. V. del Barco and A. Moroianu. "Conformal Killing symmetric tensors on Lie groups". *To appear in J. Lie Theory* (2020) arXiv:2012.08337
3. V. del Barco, A. Moroianu, and A. Raffero. "Purely coclosed G_2-structures on 2-step nilpotent Lie groups" (2021). Rev Mat Complut doi: 10.1007/s13163-021-00392-0
4. V. del Barco and A. Moroianu. "Higher degree Killing forms on 2-step nilmanifolds". *J. Algebra* 563 (2020), pp. 251–273 doi: 10.1016/j.jalgebra.2020.07.020
5. D. Conti, V. del Barco, and F. A. Rossi. "Diagram involutions and homogeneous Ricci-flat metrics". *Manuscripta Math.* 165 (2021), pp. 381–413 doi: 10.1007/s00229-020-01225-y
6. V. del Barco and A. Moroianu. "Killing forms on 2-step nilmanifolds". *J. Geom. Anal.* 31 (2021), pp. 863–887 doi: 10.1007/s12220-019-00304-1

7. V. del Barco and A. Moroianu. "Symmetric Killing tensors on nilmanifolds". *Bull. Soc. Math. France.* 148.3 (2018), pp. 411–438 doi: 10.24033/bsmf.2811

8. V. del Barco. "Symplectic structures on free nilpotent Lie algebras". *Proc. Japan Acad. Ser. A Math. Sci.* 95.8 (2019), pp. 88–90 doi: 10.3792/pjaa.95.88

9. V. del Barco and L.A.B. San Martin. "De Rham 2-cohomology of real flag manifolds". *SIGMA* 51.15 (2019), 23 p. doi: 10.3842/SIGMA.2019.051

10. V. del Barco and L. Grama. "On generalized G_2-structures and T-duality." *J. Geom. Phys.* 132 (2018), pp. 109–113 doi: 10.1016/j.geomphys.2018.05.021

11. V. del Barco, L. Grama, and L. Soriani. "T-duality on nilmanifolds." *J. High Energy Phys.* 2018.5 (2018), p. 25 doi: 10.1007/JHEP05(2018)153

12. A. P. Cruz de Freitas, V. del Barco, and L. A. B. San Martin. "Invariant almost complex structures on real flag manifolds". *Ann. Mat. Pura Appl.* 197.6 (2018), pp. 1821–1844 doi: 10.1007/s10231-018-0751-y

13. L. Cagliero and V. del Barco. "Nilradicals of parabolic subalgebras admitting symplectic structures." *Differ. Geom. Appl.* 46 (2016), pp. 1–13 doi: 10.1016/j.difgeo.2016.01.006

14. V. del Barco. "Homogeneous geodesics in pseudo-Riemannian nilmanifolds." *Adv. Geom.* 16.2 (2016), pp. 175–187 doi: 10.1515/advgeom-2016-0007

15. V. del Barco. "On a spectral sequence for the cohomology of a nilpotent Lie algebra." *J. Algebra Appl.* 14.1 (2015), p. 17 doi: 10.1142/S0219498814500789

16. V. del Barco and G.P. Ovando. "Isometric actions on pseudo-Riemannian nilmanifolds". *Ann. Glob. Anal. Geom.* 45.2 (2014), pp. 95–110 doi: 10.1007/s10455-013-9389-6

17. V. del Barco, G. Ovando, and F. Vittone. "On the isometry groups of invariant Lorentzian metrics on the Heisenberg group." *Mediterr. J. Math.* 11.1 (2014), pp. 137–153 doi: 10.1007/s00009-013-0312-y

18. V. del Barco, G. Ovando, and F. Vittone. "Lorentzian compact manifolds: isometries and geodesics." *J. Geom. Phys.* 78 (2014), pp. 48–58 doi: 10.1016/j.geomphys.2014.01.005

19. V. del Barco. "Symplectic structures on nilmanifolds: an obstruction for their existence." *J. Lie Theory* 24.3 (2014), pp. 889–908 http://www.heldermann.de/JLT/JLT24/JLT243/jlt24039.htm

20. V. del Barco and G.P. Ovando. "Free nilpotent Lie algebras admitting ad-invariant metrics". *J. Algebra* 366 (2012), pp. 205–216 doi: 10.1016/j.jalgebra.2012.05.016

PREPRINTS

1. D. Conti, V. del Barco, and F. A. Rossi. "Uniqueness of ad-invariant metrics" arXiv:1602.08286

2. V. del Barco. "Lie algebras admitting symmetric, invariant and nondegenerate bilinear forms". 2016 arXiv:1602.08286

DISSEMINATION IN CONFERENCES

Invited talks in conferences

16/07/2021 - **Killing forms on nilpotent Lie groups**
Mathematical Congress of the Americas
Universidad de Buenos Aires (online), Argentina.

02/06/2021 - **Conformal Killing forms on nilpotent Lie groups**
XVI Congreso Dr. Antonio Monteiro
Universidad Nacional del Sur (online), Argentina.

28/05/2021 - **Structures G_2 (purement) cofermées sur des groupes de Lie nilpotents de longueur 2**
Atelier sur la Géométrie différentielle et l'analyse globale
Centre de Recherches Mathématiques (online), Canada.

12/05/2021 - **Geometry of Riemannian nilpotent Lie groups**
Dia internacional das Mulheres na Matemática
Universidade Federal Fluminense (online), Brazil

29/03/2021 - **Symmetric Killing tensors on Riemannian 2-step nilpotent Lie groups**
III Summer School in Mathematics
Universidad Estadual de Maringá (online), Brazil.

14/11/2019 - **The Ricci tensor of pseudo-Riemannian nilpotent Lie groups**
Workshop on Differential Geometry and Nonassociative Algebras
Luminy, France

13/12/2018 - **Symmetric Killing tensors on nilpotent Lie groups**
III Congresso Brasileiro de Jovens Pesquisadores em Matemática Pura, Aplicada e Estatística.
Curitiba, Brazil

11/09/2018 - **Hermitian geometry of real flags**
Workshop Special Metrics and Symmetries on Complex Manifolds.
Regensburg, Germany

14/12/2016 - *T-duality on nilmanifolds*,
Conference on String Geometries and Dualities.
Rio de Janeiro, Brazil

07/12/2016 - *T-duality and mirror symmetry on nilmanifolds*
II Congresso Brasileiro de Jovens Pesquisadores em Matemática Pura e Aplicada.
Campinas, Brazil.

Contributed talks in conferences

03/09/2019 - **Symmetric Killing tensors on 2-step nilpotent Lie groups**
Bucharest Conference on Geometry and Physics.
Bucharest, Romania.

07/08/2018 - **Hermitian geometry of real flag manifolds**
International Congress of Mathematicians.
Rio de Janeiro, Brazil.

31/07/2017 - **Geometry of real flags**
V School and Workshop on Lie Theory.
Presidente Prudente, Brazil.

21/08/2017 - **On the construction of the T-dual for nilmanifolds**
Pure and Applied Differential Geometry - PADGE 2017.
Leuven, Belgium.

04/08/2016 - **Nondegenerate (0,2)-tensors on nilradicals of parabolic subalgebras**
VI Workshop on Differential Geometry (EGEO).
La Falda, Argentina.

03/08/2015 - **Nilradicals of parabolic subalgebras admitting symplectic structures**
IV School and Workshop on Lie Theory.
Campinas, Brazil.

22/07/2013 - **Isometric actions on nilmanifolds**
7th International Meeting on Lorentzian geometry.
Sao Paulo, Brazil.

28/08/2012 - **Symplectic structures on nilmanifolds**
IV Latin American conference on Lie groups and geometry.
Guanajuato, Mexico.

01/08/ 2012 - **Conditions for the existence of symplectic structures on nilmanifolds.**
Meeting on Differential Geometry (GROSA).
Rosario, Argentina.

INVITED PRESENTATIONS IN SEMINARS

06/2021 - Webinaire: Differential geometry and Non-associative algebras, Marrakesh & Metz.
06/2021 - Differential Geometry Seminar Torino (online), Italy.
09/2020 - Geometry and Topology of (Almost) Complex Structures (G&TACoS).
07/2020 - Oberseminar Geometrie und Topologie, Institut für Geometrie und Topologie, Stuttgart.
06/2020 - Geometry Webinar AmSur/AmSul, Latin America.
06/2019 - Seminar at Università di Milano Bicocca, Milan, Italy.
04/2019 - Geometry Seminar, Universidade Estadual de Campinas, Campinas, Brazil.

04/2019 - Differential Geometry (Web)Seminar at Universidad Nacional de Córdoba, Argentina.

11/2018 - Algebra, Geometry and Topology Seminar at Universidad Complutense de Madrid, Madrid, Spain.

11/2018 - Seminar at KU Leuven (Campus Kulak), Kortrijk, Belgium.

10/2018 - Seminar at Università di Milano Bicocca, Milan, Italy.

10/2018 - Geometry and Topology Seminar at Université de Bretagne Occidental, Brest, France.

06/2018 - Geometry, Topology and Dynamics Seminar at Université d'Orsay, Orsay, France.

03/2018 - Geometry Seminar at Université libre de Bruxelles, Brussels, Belgium.

11/2017 - Geometry Seminar at Universidade Estadual de Maringá, Maringá, Brazil.

11/2017 - Geometry and Topology Seminar at Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

04/2017 - Geometry Seminar at Universidade Estadual de São Paulo, São Paulo, Brazil.

05/2016 - Geometry Seminar, Universidade Estadual de Campinas, Campinas, Brazil.

FUNDING

01/2021 - 12/2022 – **Math-AMSUD Project** International coordinator of the project Geometric Structures and Moduli Spaces (# 21-MATH-06). Project gathering researchers from Argentina, Brazil, Chile and France. Eur. 17930 (2021)/ 19950 (2022).

06/2019 – **ICTP-INdAM Research in Pairs** Financial support to visit D. Conti and F. A. Rossi at Università degli Studi di Milano-Biccoca during 3 weeks. Eur. 2500.

DISTINCTIONS

03/2019 – **Marie Sklodowska-Curie Actions Seal of Excellence** SkewTorOnLie Project Submitted under the Horizon 2020 MSC actions call H2020-MSCA-IF-2018 obtained 92.2% score. This quality label is awarded to all proposals submitted to the MSCA Individual Fellowships Call that scored 85% or more but could not be funded from the call budget.

FELLOWSHIPS

05/2016 - 04/2019 – **Post-doctoral fellowship** awarded by FAPESP, support of the post-doctoral stay at Campinas, Brazil.

12/2017 - 11/2018 – **Research internship abroad (BEPE)** awarded by FAPESP, support of the visit Laboratoire de Mathématiques d'Orsay, France.

04/2012 - 03/2014 – **Post-doctoral fellowship** awarded by CONICET, support the post-doctoral stay at Rosario, Argentina.

04/2007 - 03/2012 – **PhD fellowship** awarded by CONICET, support to follow PhD programme at Rosario.

PARTICIPATION ON RESEARCH PROJECTS (Grants)

01/2021 - 12/2022 – **Math-AMSUD** Arg/Br/Cl/Fr. Geometric Structures and Moduli Spaces.
International coordinator: Viviana del Barco.
Local coordinators: Eric Loubeau (Fr), Elizabeth Gasparim (Cl), Henriqe Sá Earp (Br) and Adrián Andrada (Arg).
2018 - 2020 – **UNR** Argentina. Lie groups in pseudo- and sub- Riemannian geometry.
Coordinated by Silvio Reggaini.
2018 - 2022 – **CAPES-COFECUB** Brazil/France. Special geometry and Gauge Theory.
Coordinated by Henriqe Sá Earp and Eric Loubeau.
2014 - 2016 – **PICT Foncyt** Argentina. Geometric structures of homogeneous spaces.
Coordinated by Gabriela Ovando.
2013 - 2017 – **UNR** Argentina. Homogeneous structures on differentiable manifolds.
Coordinated by Gabriela Ovando.
2013 - 2015 – **PIP CONICET** Argentina. Geometric structures of solvmanifolds.
Coordinated by Isabel Dotti.
2011 - 2015 – **PICT Foncyt** Argentina. Geometry and spectral theory of locally homogeneous manifolds.
Coordinated by Roberto Miatello.
2009 - 2012 – **UNR** Argentina. Geometric structures on differentiable manifolds.

EXAMINATION PANELS

04/02/2021 – **Doctorate Thesis** of Jhoan Sebastian Baez Acevedo.
Supervisor: Luiz A. B. San Martin.
Universidade Estadual de Campinas, Brazil.

15/02/2019 – **Master Thesis** of Heber Cristina Teixeira.
Supervisor: Lonardo Rabelo.
Universidade Federal de Juiz de Fora, Brazil.

26/09/2017 – **Doctorate Thesis** of Jordam Lambert Silva.
Supervisor: Luiz A. B. San Martin.
Universidade Estadual de Campinas, Brazil.

22/03/2017 – **Master Thesis** of Julieth Paola Saavedra Ramírez.
Supervisor: Henrique Sá Earp.
Universidade Estadual de Campinas, Brazil.
04/09/2017 – **Qualification exam** (Doctorate program) of Carlos Augusto Bassani Varea.
Supervisor: Luiz A. B. San Martin
Universidade Estadual de Campinas, Brazil.
15/07/16 – **Qualification exam** (Doctorate program) Leonardo Soriani Alves.
Supervisor: Lino Grama
Universidade Estadual de Campinas, Brazil.

06/04/2017 – **Qualification exam** (Doctorate program) Kennerson Nascimento de Sousa Lima.
Supervisor: Lino Grama.
Universidade Estadual de Campinas, Brazil.

CO-ORGANISATION OF SCIENTIFIC EVENTS

08/2020 – **Differential Geometry Session** at VI Congreso Latinoamericano de Matemáticos, Montevideo, Uruguay `www.clam2020.cmat.edu.uy/` (Covid-19 suspended)

07/2012 – **Meeting on Differential Geometry (GROSA).** Universidad Nacional de Rosario, Argentina.
`www.fceia.unr.edu.ar/~grosa/`

FURTHER RESPONSIBILITIES

Since 29/11/2012 – **Reviewer** for Zentralblatt MATH

Since 01/01/2015 – **Reviewer** for Mathematical Reviews of the AMS

01/08/2012 - 01/06/2015 – **Local secretary** in Rosario of the Unión Matemática Argentina, Argentinian Mathematical Union.

LANGUAGE SKILLS

Spanish (mother tongue)
Portuguese (advanced)
English (advanced)
French (intermediate-advanced)
Italian (intermediate)