Giovanni Russo

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Born: April 3rd, 1992—Firenze, Italy
Nationality: Italian

Current position

01/2024–Present *Research grant holder*. SISSA - Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy. Mentor: Prof. Antonio Lerario.

Previous positions

01/2024–04/2025 *Courtesy postdoctoral associate*. Department of Mathematics and Statistical Sciences, Florida International University, Miami, USA. Mentor: Prof. Anna Fino.

01/2023–31/2023 *Postdoctoral associate*. Department of Mathematics and Statistical Sciences, Florida International University, Miami, USA. Mentor: Prof. Anna Fino.

09/2021–12/2022 *Postdoctoral fellow*. Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica, Università degli Studi dell'Aquila, Italy. Mentor: Prof. Barbara Nelli.

04/2020–08/2021 *Postdoctoral fellow*. FB12 | Mathematik und Informatik, Differentialgeometrie und Analysis, Philipps-Universität Marburg, Germany. Mentor: Prof. Dr. habil. Ilka Agricola.

02/2020–03/2020 *Postdoctoral guest*. Max-Planck-Institut für Mathematik, Bonn, Germany.

11/2019–12/2019 *Research assistant*. Institut for Matematik, Geometry and Topology group, Aarhus Universitet, Denmark. Supervisor: Prof. Andrew Swann.

11/2016–10/2019 *Ph.D. student*. Institut for Matematik, Centre for Quantum Geometry of Moduli Spaces (QGM), and Geometry and Topology group, Aarhus Universitet, Denmark. Supervisor: Prof. Andrew Swann.

Areas of specialisation

Differential geometry, in particular Riemannian geometry. My interests include

- Riemannian manifolds with special and exceptional holonomy, connections with particle physics, string theory, M-theory.
- Einstein and Ricci-flat metrics.
- Representation theory of Lie groups and algebras, geometries described by Lie groups.
- Moment and multi-moment maps, invariants of group actions.
- Clifford algebras, spin geometry, connections with special G-structures.
- Torus-actions, GKM theory and graphs, equivariant cohomology.
- Geometry and topology of submanifolds with special curvature properties or symmetries.
- Morse theory, topology of low dimensional manifolds.
- Integral geometry, zonoid algebras, probabilistic intersection rings.

Preprints and publications

2026 Alejandro Gil-García, Giovanni Russo, *Left-invariant harmonic spinors on three-dimensional Lie groups*. ArXiv preprint,
(arXiv:2604.16681).

2026 Giovanni Russo, Andrew Swann, *Nearly parallel G_2-structures with torus symmetry*. Mathematische Zeitschrift 313, 44 (2026).
(arXiv:2508.21703, DOI: 10.1007/s00209-026-04062-z).

2025 Giovanni Russo, *Topics in representation theory and Riemannian geometry*. ArXiv preprint. Accepted by Routledge and CRC Press, Taylor & Francis Group.
(arXiv:2504.13689).

2024 Anna Fino, Gueo Grantcharov, Giovanni Russo, *On the ν-invariant of two-step nilmanifolds with closed G_2-structure*. ArXiv preprint.
(arXiv:2409.06870).

2024 Barbara Nelli, Giuseppe Pipoli, and Giovanni Russo, *On constant higher order mean curvature hypersurfaces in $\mathbb{H}^n \times \mathbb{R}$*. Advanced Nonlinear Studies, vol. 24(1) (Feb. 2024), 44–73.
(arXiv:2304.00349, DOI: 10.1515/ans-2023-0115).

2023 Oliver Goertsches, Eugenia Loiudice, and Giovanni Russo, *GKM actions on cohomogeneity one manifolds*. Forum Mathematicum, vol. 35(2) (Jan. 2023), 391–407.
(arXiv:2202.07700, DOI: 10.1515/forum-2022-0061).

2021 Giovanni Russo, *The Einstein condition on nearly Kähler six-manifolds*. Expositiones Mathematicae, vol. 39(3) (Sep. 2021), 384–410.
(arXiv:2002.04673, DOI: 10.1016/j.exmath.2020.10.002).

2021 Giovanni Russo, *Multi-moment maps on nearly Kähler six-manifolds*. Geometriae Dedicata, vol. 213(1) (Aug. 2021), 57–81.
(arXiv:1911.12420, DOI: 10.1007/s10711-020-00568-w).

2019 Giovanni Russo and Andrew Swann, *Nearly Kähler six-manifolds with two-torus symmetry*. Journal of Geometry and Physics, vol. 138, (Apr. 2019), 144–153.
(arXiv:1809.05304, DOI: 10.1016/j.geomphys.2018.12.016).

Education

01/2020 PH.D. in Mathematics. Thesis: *Torus symmetry and nearly Kähler metrics*. Supervisor: Prof. Andrew Swann. Institut for Matematik, Aarhus Universitet.
Link: https://data.math.au.dk/publications/phd/2020/math-phd-2020-gr.pdf.

07/2016 M.SC. in Mathematics. Thesis: *Minimal geodesics on Riemannian manifolds and geodesic flow on nilpotent Lie groups*. Supervisor: Prof. Anna Fino. Dipartimento di Matematica "G. Peano", Università degli Studi di Torino. Evaluation: 110/110 cum laude and mention.

10/2014 B.SC. in Mathematics. Thesis: *Dinamica simbolica nel problema degli N corpi*. Supervisor: Prof. Susanna Terracini. Dipartimento di Matematica "G. Peano", Università degli Studi di Torino. Evaluation: 110/110 cum laude.

Grants

2026 INdAM, National Group for Algebraic and Geometric Structures, and their Applications (GNSAGA). Financial support for scientific activity at L'Aquila, June 2026 (€200).

2025 INdAM, National Group for Algebraic and Geometric Structures, and their Applications (GNSAGA). Financial support for scientific activity at L'Aquila, June–July 2025 (€400).

2024 INdAM, National Group for Algebraic and Geometric Structures, and their Applications (GNSAGA). Financial support for scientific collaboration with Prof. Andrew Swann, October 2024 (€600).

2024 Scuola Internazionale Superiore di Studi Avanzati, Trieste. Research grant holder in Mathematics, 2024–2026 (€30,000/year).

2021 INdAM, National Group for Algebraic and Geometric Structures, and their Applications (GNSAGA). Postdoctoral fellowship 2020–21 (€24,000/year). Declined for another offer.

2020 Max-Planck-Institut für Mathematik, Bonn. Visiting grant 02/2020–03/2020 (€2100/month).

Research stays

2024 Collaboration with Prof. Andrew Swann, 17th Jun.–21st Jun. 2024, and 7th Oct.–11th Oct. 2024. Institut for Matematik, Aarhus Universitet.

2019 Collaboration with Dr. Lorenzo Foscolo, 12th Jan.–16th Mar. 2019. Department of Mathematics, Heriot–Watt University, Edinburgh.

2018 Collaboration with Prof. Andrei Moroianu, 15th Sep.–23rd Nov. 2018. Laboratoire de Mathématiques d'Orsay, Université Paris–Saclay, Orsay.

Invited talks

Nov. 2024 *The ν-invariant on two-step nilmanifolds with closed G_2-structure*, KTH Stockholm.

Oct. 2024 *The ν-invariant on two-step nilmanifolds with closed G_2-structure*, Aarhus Universitet.

Jun. 2024 *3-(α, δ)-Sasaki manifolds*, Università degli Studi di Torino.

Apr. 2024 *Nearly Kähler metrics and torus symmetry*, Università degli Studi di Bari.

Mar. 2024 *Introduction to Sasakian geometry*, Università degli Studi di Torino.

Feb. 2024 *Toric nearly Kähler six-manifolds*, SISSA.

Feb.–Jun. 2024 *Contact and Sasakian geometry*, Università degli Studi di Torino.

Jan. 2024 *Nearly Kähler metrics and torus symmetry*, SISSA.

Sep. 2023 *Nearly Kähler metrics and torus symmetry*, University of Waterloo.

May 2023 *Special geometric structures and symmetries*, conference talk, Subtropic Symposium for Upcoming Mathematicians, Florida International University.

Mar. 2023 *An introduction to Riemannian geometry*, Florida International University.

Dec. 2022 *GKM actions on cohomogeneity one manifolds*, conference talk, XMaths seminars, Università degli Studi di Bari.

Nov. 2022 *GKM actions on cohomogeneity one manifolds*, conference talk, YMCAq seminars, Università degli Studi dell'Aquila.

Mar. 2022 *Fixed points of isometries*, conference talk, MAM II, Philipps-Universität Marburg.

Nov. 2021 *Nearly Kähler six-manifolds with two-torus symmetry*, Masaryk University (online).

Jul. 2021 *Spin manifolds and group actions*, Philipps-Universität Marburg.

Jun. 2021 *Nearly Kähler geometry and torus symmetry*, Università degli studi dell'Aquila (online).

Apr. 2021 *Nearly Kähler geometry and torus symmetry*, Imperial College London (online).

Feb. 2021 *Nearly Kähler geometry and torus symmetry*, KU Leuven (online).

Dec. 2020 *Metrics with special holonomy*, conference talk, Welcome Home, Università degli Studi di Torino.

Nov. 2020 *Metrics with exceptional holonomy*, Philipps-Universität Marburg.

Jul. 2020 *Almost complex and almost Kähler manifolds via harmonic theory*, Philipps-Universität Marburg.

Jun. 2020 *Some aspects of nearly Kähler geometry*, Philipps-Universität Marburg.

Feb. 2020 *An introduction to nearly Kähler geometry*, Max-Planck-Institut für Mathematik, Bonn.

Dec. 2019 *Geometria nearly Kähler e mappe multi-momento*, Università degli Studi di Torino.

Apr. 2019 *Nearly Kähler six-manifolds and multi-moment maps*, Philipps-Universität Marburg.

Feb. 2019 *Nearly Kähler geometry in dimension six, torus symmetry, multi-moment maps*, Heriot–Watt University, Edinburgh.

Feb. 2019 *Torus reduction of nearly Kähler six-dimensional sine-cones over Sasaki–Einstein five-manifolds*, Bayes Centre, University of Edinburgh.

Jan.–Mar. 2019 *Moment maps working seminar*, Bayes Centre, University of Edinburgh.

Jan. 2019 *Nearly Kähler six-manifolds with two-torus symmetry*, King's College London.

Dec. 2018 *Varietà nearly Kähler in dimensione sei con simmetria torica*, conference talk, Welcome Home, Università degli Studi di Torino.

Nov. 2018 *Nearly Kähler six-manifolds with two-torus symmetry*, Universität Stuttgart.

Nov. 2017 *Graphs and geometry of six-dimensional nearly Kähler manifolds with two-torus action*, conference talk, Sandbjerg Estate.

Oct. 2017 *Introduction to Calabi–Yau manifolds, Donaldson–Thomas invariants, and spin structures in dimension six*, Aarhus Universitet.

May 2017 *Clifford algebras and spin groups*, Aarhus Universitet.

Mar. 2017 *Hodge diamond of the quintic 3-fold*, Aarhus Universitet.

Feb. 2017 G_2*-structures and introduction to nearly Kähler six-manifolds*, Aarhus Universitet.

Nov. 2014 *On the restricted 3-body problem*, Università degli Studi di Torino.

Activities

Spring 2025 Working group on special holonomy, SISSA–ICTP.

Spring 2025 Reading group on o-minimality, SISSA.

Fall 2024 Reading group on generalised complex geometry, SISSA.

Spring 2024 Reading group on contact and Sasakian manifolds (online). Università degli Studi di Torino.

Spring 2024 Reading group on symmetric spaces (online). PRIN collaboration.

Spring 2024 Weekly meetings on group research, SISSA.

Spring 2023 Weekly meetings on group research, Florida International University.

Fall 2022 YMCAq seminars in Mathematics, Università degli Studi dell'Aquila.

Spring 2021 Learning semester on spin geometry, Philipps-Universität Marburg.

Fall 2020 Learning semester on special geometries, Philipps-Universität Marburg.

Spring 2020 Learning semester on almost complex geometries, Philipps-Universität Marburg.

Winter 2019 Reading group on special geometries with symmetries, Bayes Centre, University of Edinburgh.

Winter 2017 Reading group on algebraic and complex geometry, Aarhus Universitet.

Winter 2014 Reading group on celestial mechanics, Università degli Studi di Torino.

Conferences & workshops attended

Jun. 2026 *IGAP Special Working Workshop: Geometric Constructions of Manifolds with Special Holonomy*, ICTP, Trieste.

May 2026 *International Conference on Complex and Differential Geometry*, ICTP, Trieste.

Mar. 2026 *Algebraic aspects of Metric and Integral Geometry*, Bernoulli Center, EPFL, Lausanne.

Dec. 2025 *Riemannian Geometry and related topics*, Università degli Studi di Torino.

Jun. 2025 *Differential Geometry @ L'Aquila*, Università degli Studi dell'Aquila.

May 2025 *New challenges across Analysis and Geometry*, SISSA, Trieste.

Feb. 2025 *MAM III: Quaternion-Kähler manifolds and the LeBrun–Salamon Conjecture*, Philipps-Universität Marburg.

Nov. 2024 *Workshop on Metric Algebraic Geometry*, KTH, Stockholm.

Sep. 2024 *School and Conference on Metric Measure Spaces, Ricci Curvature, and Optimal Transport*, Villa Monastero, Lake Como.

Sep. 2024 2 *Days on Geometric Structures and Function Theories*, Università degli Studi di Bari.

Dec. 2023 *Geometry Conference: 50 years of Nigel Hitchin's Mathematics*, University of Miami.

Jun. 2023 *Real and Complex Manifolds: Topology, Geometry, and Holomorphic Dynamics*, Università degli Studi di Roma Tor Vergata.

May 2023 *Spinorial and Octonionic Aspects of* G_2 *and* Spin(7) *Geometry*, Juniper Hotel, Banff.

May 2023 *Quantum Toric Geometry, Generalized Geometries and O-Minimality*, University of Miami.

Dec. 2022 *XMaths Workshop 2022*, Università degli Studi di Bari.

Jun. 2022 *Seminar Sophus Lie @ Nordfjordeid*, Sophus Lie Conference Center, Nordfjordeid.

Oct. 2021 *Workshop on Special Geometries on Riemannian Manifolds*, CRM, Montreal (online).

Sep. 2020 *Workshop on Multisymplectic geometry*, KU Leuven.

Mar. 2020 *Higher Geometric Structures along the lower Rhine XIV*, Max-Planck-Institut für Mathematik, Bonn.

Jun. 2019 *VBAC 2019, GIT, wall-crossing and moduli spaces*, Sandbjerg Estate.
May 2019 *Kähler and special toric geometry*, King's College London.
Apr. 2019 *Differential Geometry Day*, Università degli Studi di Torino.
Apr. 2019 *Topics in non-linear analysis and calculus of variations*, Università degli Studi di Torino.
Mar. 2019 *Integrability and Twistor theory*, Bayes Centre, University of Edinburgh.
Oct. 2018 *QGM Nielsen retreat*, Sandbjerg Estate.
Sep. 2018 *Special Metrics and Symmetries on Complex Manifolds*, Universität Regensburg.
Aug. 2018 *Riemannian holonomy groups & Gauge theory and instanton moduli spaces*, Aarhus Universitet.
Jul. 2018 *Geometry, Quantum topology and Asymptotics 2018*, Confucius Institut, Geneva.
May 2018 *13th Geometry Day*, Lunds Universitet.
May 2018 *Pluripotential Theory, Geometric Analysis and Calibrated Geometry*, Università degli Studi di Torino.
Nov. 2017 *QGM Nielsen retreat*, Sandbjerg Estate.
Sep. 2017 *Modern moduli theory*, University of Oxford.
Aug. 2017 *Padge 2017*, KU Leuven.
Aug. 2017 *GEOQUANT*, Aarhus Universitet.
Jun. 2017 *GAeL XXV*, University of Bath.

Teaching

2025 Lecturer for *Topics in Riemannian Geometry and Representation Theory*, PhD course, SISSÀ.
2023 Lecturer for *Differential geometry*, Independent Study, Fall B, Florida International University.
2022 Lecturer for *Matematica zero*, DSFC, Università degli Studi dell'Aquila.
2022 Assistant for *Geometria A, Precorso di Matematica*, DISIM, Università degli Studi dell'Aquila.
2021 Lecturer for *Matematica zero*, DSFC, Università degli Studi dell'Aquila.
2021 Assistant for *Geometria I3N*, DISIM, Università degli Studi dell'Aquila.
2021 Assistant for *Linear algebra 2, Analysis 1*, Mathematik und Informatik, Philipps-Universität Marburg.
2020/21 Assistant for *Linear algebra 1*, Mathematik und Informatik, Philipps-Universität Marburg.
2020 Assistant for *Algebraic Topology*, Mathematik und Informatik, Philipps-Universität Marburg.
2020 Assistant for *Complex Geometry*, Mathematik und Informatik, Philipps-Universität Marburg.
2019 Assistant for *Differential equations*, Institut for Matematik, Aarhus Universitet.
2018 Assistant for *Mathematical Analysis 2*, Institut for Matematik, Aarhus Universitet.
2017 Assistant for *Mathematical Analysis 1*, Institut for Matematik, Aarhus Universitet.
2017 Assistant for *Mathematical Analysis 1 and 2*, Institut for Matematik, Aarhus Universitet.
2015 Assistant for *Algebra 1, Geometria 2*, Dipartimento di Matematica, Università degli Studi di Torino.

Review activity & editorial work

I am a reviewer for MathSciNet and zbMATH Open. I have been peer reviewer for the following journals:

- The Quarterly Journal of Mathematics.
- Analysis and Mathematical Physics.
- Abstract and Applied Analysis.
- International Journal of Geometric Methods in Modern Physics.
- Complex manifolds.

Computer skills

LaTeX (daily use), Terminal (daily use), C++, Microsoft Office, Math softwares (Maple, Geogebra, LiE).

Language skills

- Italian: mothertongue.
- English: fluent (level C1, IELTS, British Council Milan, Oct. 2016).
- German: intermediate (level B1, Goethe–Institut Rom, Feb. 2022).
- Danish: basic knowledge (module 2, Lærdansk, Aarhus, Mar. 2018).
- French: basic knowledge.



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