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Personal Details

Date of birth: July 14, 1968

Place of birth: Bari

Citizenship: Italian

Academic Position

02/1996–Present: Assistant Professor in Mathematical Analysis, Italian Academic Discipline (SSD) MATH-03/A, Department of Mathematics, University of Bari Aldo Moro, Italy

Education

01/1993–12/1996: Ph.D. student in Mathematics, Scuola Normale Superiore, Pisa

July 17, 1992: Degree in Mathematics, University of Bari Aldo Moro, *110/110 e lode*, Degree thesis: *"Soluzioni omocliniche di sistemi hamiltoniani"*, Supervisors: Prof. A. Capozzi and Prof. D. Fortunato

11/1987–07/1992: Student in the four-year Degree Program in Mathematics (Master's Degree), University of Bari Aldo Moro, Italy

1987: Scientific High School Diploma, "A. Scacchi" Scientific High School, Bari, Italy

Research Interests

- Photon and massive-particle hypersurfaces in stationary spacetimes
- Convexity of domains in Riemannian, Finslerian, and Lorentzian manifolds
- Relativistic and non-relativistic Lorentz-force trajectories
- Geodesics in Riemannian and Lorentzian geometry
- Variational methods for nonlinear differential equations

Publications

Research Papers.....

1. R. Bartolo, E. Caponio, A.V. Germinario, M. Sánchez, Lorentzian-Euclidean black holes and Lorentzian to Riemannian metric transitions, *Phys. Rev. D* **111**, 104058 (2025) doi:[10.1103/PhysRevD.111.104058](https://doi.org/10.1103/PhysRevD.111.104058)
2. E. Caponio, A.V. Germinario, M. Sánchez, Convex regions of stationary spacetimes and Randers spaces. Applications to lensing and asymptotic flatness, *J. Geom. Anal.* **26**, 791–836 (2016) doi:[10.1007/s12220-015-9572-z](https://doi.org/10.1007/s12220-015-9572-z)
3. R. Bartolo, E. Caponio, A.V. Germinario, M. Sánchez, Convex domains of Finsler and Riemannian manifolds, *Calc. Var. Partial Differential Equations* **40**, 335–356 (2011) doi:[10.1007/s00526-010-0343-1](https://doi.org/10.1007/s00526-010-0343-1)
4. R. Bartolo, A. Germinario, Trajectories of a charge in a magnetic field on Riemannian manifolds with boundary, *Dyn. Contin. Discrete Impuls. Syst. Ser. A Math. Anal.* **17**, 363–376 (2010)
5. R. Bartolo, A. Germinario, Convexity conditions on the boundary of a stationary spacetime and applications, *Commun. Contemp. Math.* **11**, 739–769 (2009) doi:[10.1142/S0219199709003545](https://doi.org/10.1142/S0219199709003545)
6. A. Germinario, Geodesics in stationary spacetimes and classical Lagrangian systems, *J. Differential Equations* **232**, 253–276 (2007) doi:[10.1016/j.jde.2006.09.009](https://doi.org/10.1016/j.jde.2006.09.009)
7. R. Bartolo, A. Germinario, Orthogonal trajectories on Riemannian manifolds and applications to Plane Wave type spacetimes, *Nonlinear Anal.* **66**, 2355–2363 (2007) doi:[10.1016/j.na.2006.03.027](https://doi.org/10.1016/j.na.2006.03.027)
8. A. Germinario, Timelike trajectories with fixed energy under a potential in static spacetimes, *Int. J. Math. Math. Sci.* **2006**, 11, 86952 (2006) doi:[10.1155/IJMMS/2006/86952](https://doi.org/10.1155/IJMMS/2006/86952)
9. R. Bartolo, A. Germinario, Timelike spatially closed trajectories under a potential on splitting Lorentzian manifolds, *Commun. Appl. Anal.* **9**, 177–205 (2005)
10. R. Bartolo, A. Germinario, M. Sánchez, Trajectories connecting two submanifolds on non-oomplete Lorentzian manifolds, *Electron. J. Differential Equations*, 110, 1–20 (2004)
11. R. Bartolo, A. Germinario, M. Sánchez, Orthogonal trajectories on stationary spacetimes under intrinsic assumptions, *Topol. Methods Nonlinear Anal.* **24**, 239–268 (2004)
12. R. Bartolo, A. Germinario, Trajectories joining two submanifolds under the action of gravitational and electromagnetic fields on static spacetimes, *Math. Phys. Anal. Geom.* **5**, 125–143 (2002) doi:[10.1023/A:1016284210812](https://doi.org/10.1023/A:1016284210812)
13. R. Bartolo, A. Germinario, M. Sánchez, Existence of a closed geodesic on non-compact Riemannian manifolds with boundary, *Adv. Nonlinear Stud.* **2**, 51–69 (2002) doi:[10.1515/ans-2002-0104](https://doi.org/10.1515/ans-2002-0104)
14. R. Bartolo, A. Germinario, M. Sánchez, A note on the boundary of a static Lorentzian manifold, *Differential Geom. Appl.* **16**, 121–131 (2002) doi:[10.1016/S0926-2245\(02\)00062-1](https://doi.org/10.1016/S0926-2245(02)00062-1)
15. R. Bartolo, A. Germinario, M. Sánchez, Convexity of domains of Riemannian manifolds, *Ann. Global Anal. Geom.* **21**, 63–83 (2002) doi:[10.1023/A:1014231603588](https://doi.org/10.1023/A:1014231603588)

16. A. Germinario, Geodesics on Lorentzian Manifolds with Convex Boundary, *Nonlinear Anal.* **47**, 5, 3543–3548 (2001), Proceedings of the Third World Congress of Nonlinear Analysts, Part 5 (Catania, 2000) doi:[10.1016/S0362-546X\(01\)00472-2](https://doi.org/10.1016/S0362-546X(01)00472-2)
17. R. Bartolo, A. Germinario, Geodesics with prescribed energy on static Lorentzian manifolds with convex boundary, *J. Geom. Phys.* **32**, 293–310 (2000) doi:[10.1016/S0393-0440\(99\)00034-0](https://doi.org/10.1016/S0393-0440(99)00034-0)
18. A. Germinario, F. Giannoni, Existence and multiplicity results for massive particles trajectories in a universe with boundary, *J. Math. Phys.* **40**, 5835–5848 (1999) doi:[10.1063/1.533058](https://doi.org/10.1063/1.533058)
19. R. Bartolo, A. Germinario, M. Sánchez, Periodic trajectories with fixed energy on Riemannian and Lorentzian manifolds with boundary, *Ann. Mat. Pura Appl.* **177**, 241–262 (1999) doi:[10.1007/BF02505911](https://doi.org/10.1007/BF02505911)
20. F. Antonacci, A. Germinario, R. Sampalmieri, Light rays having extreme points with the same spatial coordinates, *Differential Geom. Appl.* **10**, 161–178 (1999) doi:[10.1016/S0926-2245\(99\)00008-X](https://doi.org/10.1016/S0926-2245(99)00008-X)
21. A. Germinario, F. Giannoni, Morse theory for Riemannian geodesics without nondegeneracy assumptions, *Topol. Methods Nonlinear Anal.* **10**, 295–325 (1997)
22. A. Germinario, On a Morse Theory for Light Rays without Nondegeneracy Assumptions, *Nonlinear Anal.: Theory Methods Appl.* **30**, 2, 747–758 (1997), Proceedings of the Second World Congress of Nonlinear Analysts doi:[10.1016/S0362-546X\(97\)00034-5](https://doi.org/10.1016/S0362-546X(97)00034-5)
23. A. Germinario, Morse theory for light rays without nondegeneracy assumptions, *Nonlinear World*, 173–206 (1997)
24. A. Germinario, Homoclinics on Riemannian manifolds with convex boundary, *Dynam. Systems Appl.* **4**, 549–566 (1995)
25. A. Germinario, Heteroclinic orbits on noncompact Riemannian manifolds, *Rend. Mat. Appl.* **15**, 263–279 (1995)

Preprints.....

26. E. Caponio, A.V. Germinario, A. Masiello, *A unified framework for photon and massive particle hypersurfaces in stationary spacetimes* <https://arxiv.org/abs/2602.11883>

Proceedings.....

27. A. Germinario, *Infinitesimal Convexity in Stationary Spacetimes* in *International Meeting on Differential Geometry, Córdoba 2010* (eds Albuja, A., Caballero, M., Rubio, R.) (Ediciones Don Folio, Córdoba, Spain, 2012), 93–102, ISBN: 978-84-15105-91-6

Grants

09/05/2012–09/05/2013: Participant in the project INdAM–GNAMPA Project 2012 “*Analisi Geometrica sulle varietà di Lorentz ed applicazioni alla Relatività Generale*” (Geometric Analysis on Lorentz Manifolds and Applications to General Relativity”, head of the project Prof. A. Masiello (Polytechnic University of Bari, Italy)

17/10/2011–17/10/2013: Participant in the PRIN 2009 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

27/04/2011–27/04/2012: Participant in the INdAM–GNAMPA Project 2011 “*Analisi Geometrica sulle varietà di Lorentz ed applicazioni alla Relatività Generale*” (Geometric Analysis on Lorentz Manifolds and Applications to General Relativity), head of the project Prof. A. Masiello (Polytechnic University of Bari, Italy)

26/01/2009–31/03/2011: Participant in the project Azione Integrata Italia–Spagna 2009 “*Metodi Variazionali e Topologici in Analisi Nonlineare e Geometria con Applicazioni*” (Variational and Topological Methods in Nonlinear Analysis and Geometry and Applications), coordinators: Prof. G. Cerami (Polytechnic University of Bari, Italy), Prof. M. Sánchez (University of Granada, Spain)

22/09/2008 –22/09/2010: Participant in the PRIN 2007 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

30/01/2006–30/01/2008: Participant in the PRIN 2005 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

20/11/2003–20/11/2005: Participant in the PRIN 2003 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

12/12/2001–12/12/2003: Participant in the PRIN 2001 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

26/11/1999–26/11/2001: Participant in the PRIN 1999 research project “*Metodi variazionali e topologici ed equazioni differenziali non lineari*” (Variational and Topological Methods and Nonlinear Differential Equations), coordinated by Prof. V. Benci

15/02/1998–15.02/2000: Participant in the PRIN 1997 research project “*Metodi variazionali e topologici e applicazioni allo studio di equazioni differenziali non lineari*” (Variational and Topological Methods and Applications to the Study of Nonlinear Differential Equations), coordinated by Prof. L. Ambrosio

Academic Service

2024–Present: Member of the working group for the B.Sc. in Mathematics admission test, Department of Mathematics, University of Bari Aldo Moro

2024: Member of the selection committee for a Postdoctoral research fellowship in Mathematical Analysis, Department of Mathematics, University of Bari Aldo Moro

2021–2025: Member of the Department of Mathematics Board, University of Bari Aldo Moro

2010: Member of the selection committee for a research fellowship in Mathematical Analysis, Department of Mathematics, University of Bari Aldo Moro

2007: Member of the selection committee for a Researcher position (Scientific Disciplinary Sector MAT/05 – Mathematical Analysis), Faculty of Engineering, University of Calabria

2004: Member of the selection committee for a research fellowship in Mathematical Analysis, Department of Mathematics, University of Bari Aldo Moro

Memberships

- INdAM-GNAMP (Italian National Group for Mathematical Analysis, Probability and their Applications)
- UMI (Italian Mathematical Society)

Conference Presentations and Seminars

- *Convex domains of Finsler and Riemannian manifolds*, seminar at the Department of Geometry and Topology of the University of Granada, Spain, November 22, 2010
- *Convexity conditions on the boundary of a stationary spacetime and applications*, contributed talk, International Meeting on Differential Geometry, Córdoba, Spain, November 2010
- *Geodesics in stationary spacetimes: dynamical systems and convexity conditions*, invited talk, Variational and Topological Methods in Nonlinear Phenomena, Otranto, Italy, May 2008
- *Geodetiche su varietà Lorentziane stazionarie e sistemi dinamici classici (Geodesics on stationary Lorentzian manifolds and classical dynamical systems)*, contributed talk, XVIII UMI (Italian Mathematical Society) Congress, Bari, Italy, September 2007
- *Geodesics in standard stationary spacetimes and Lagrangian systems*, contributed talk, IV International Meeting on Lorentzian geometry, Santiago de Compostela, February 2007
- *Geodesics on Lorentzian manifolds with convex boundary*, invited talk, The Third World Congress of Nonlinear Analysts, Catania, Italy, July 2000
- *Traiettorie periodiche con fissata energia su varietà Riemanniane e Lorentziane con bordo (Periodic trajectories with fixed energy on Riemannian and Lorentzian manifolds with boundary)*, contributed talk, XVI UMI (Italian Mathematical Society) Congress, Naples, Italy, September 1999
- *Morse Theory for Light Rays without Nondegeneracy Assumptions*, invited talk, Second World Congress of Nonlinear Analysts, Athens, Greece, July 1996
- *Teoria di Morse per le geodetiche senza ipotesi di nondegenerazione (Morse Theory for Geodesics without Nondegeneracy Assumptions)*, seminar at the Department of Mathematics, University of Bari Aldo Moro, Italy, June 4, 1996

Other Academic Activities

- Reviewer for the Mathematical Review of the AMS
- Member of the organizing committee of the workshop *V International Meeting on Lorentzian Geometry*, Martina Franca, Taranto, Italy, July 8–11, 2009

Teaching activity

Teaching Assignments, University of Bari.....

2025/2026: *Elements of Real and Complex Analysis*, B.Sc. in Mathematics, (16 lecture hours, 15 tutorial hours)

2023/2024–2024/2025: *Elements of Advanced Analysis I*, B.Sc. in Mathematics, (16 lecture hours, 15 tutorial hours)

2021/2022–2023/2024: *Fundamentals of Mathematics for Data Science*, M.Sc. in Data Science, Teaching Assistant

2015/2016–2025/2026: *Calculus*, B.Sc. in Computer Science, Instructor of Record

2010/2011–2013/2014: *Calculus*, B.Sc. in Computer Science and Digital Communication, Instructor of Record

2005/2006–2009/2010: *Calculus*, B.Sc. in Computer Science – Brindisi, Instructor of Record

2004/2005–2020/2021: *Mathematical Analysis 4*, B.Sc. in Mathematics, Teaching Assistant

2004/2005: *Mathematical Analysis 1*, B.Sc. in Material Science and Technology, Teaching Assistant

2003/2004–2004/2005, 2014–2015: *Calculus*, B.Sc. in Computer Science and Technologies for Software Production, Instructor of Record

2002/2003: *Applied Mathematics and Statistics*, B.Sc. in Conservation and Restoration of Natural Heritage, Teaching Assistant

2002/2003–2003/2004: *Calculus I, II, III*, B.Sc. in Physics, Teaching Assistant

2001/2002: *Mathematical Analysis II*, M.Sc. in Mathematics, Physics, Computer Science, Teaching Assistant

1999/2000–2001/2002: *Mathematical Analysis II*, M.Sc. in Physics, Teaching Assistant

1998/1999: *Mathematical Analysis I*, M.Sc. in Mathematics, Physics, Computer Science, Teaching Assistant

1995/1996–2000/2001: *Mathematical Analysis I*, M.Sc. in Computer Science, Teaching Assistant

Teaching Assignments, Polytechnic University of Bari.....

2001/2002: *Mathematical Analysis II*, B.Sc. in Computer Science and Automation, Instructor of Record

Thesis Supervision.....

Supervised five Bachelor's theses in Mathematics at the University of Bari

August 28, 2026