

SANTIAGO BARBIERI

PROFESSOR LECTOR - UNIVERSITAT DE GIRONA

Contacts



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08/03/1991, Firenze, Italy

Spoken languages

Italian	Spanish	English	French	Catalan	Portuguese
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Career

2025-Now	Professor Lector (Junior Professor) <i>Universitat de Girona</i>
2024-2025	Juan de la Cierva Postdoctoral Researcher <i>Universitat Politècnica de Catalunya</i>
2023-2024	Part-time lecturer <i>Universitat Politècnica de Catalunya</i>
2023-2024	Postdoctoral Researcher <i>Universitat de Barcelona</i>
2022-2023	Attaché Temporaire d'Enseignement et de Recherche (Lecturer) <i>Université Paris Dauphine</i>

Education

2019-2023	PhD in pure mathematics <i>Université Paris-Saclay - Università degli studi Roma Tre</i> <i>Title: Stability in Hamiltonian Systems: steepness and regularity in Nekhoroshev Theory</i> <i>Advisors: L. Niederman (U. Paris-Saclay) and L. Biasco (U. Roma Tre)</i> <i>Referees: D. Bambusi (U. Milano) and P. Bolle (Avignon U.)</i> <i>Examiners: M.-C. Arnaud (U. Paris Cité), S. Crovisier (CNRS), Bassam Fayad (U. Maryland)</i>
2016-2017	Master 2 in Analysis and Probability <i>Université Paris Dauphine</i>
2015-2016	Master 2 in Dynamics of Gravitational Systems <i>Sorbonne Université</i>
2014-2015	Master 1 of Physics <i>Sorbonne Université</i>
2010-2014	Bachelor of Physics <i>Alma Mater Studiorum Università di Bologna</i>
2005-2010	High School Diploma (Scientific Track) <i>Liceo Scientifico Guido Castelnuovo, Firenze</i>

Articles

1. S. Barbieri, L. Niederman, *Sharp Nekhoroshev estimates for the three-body problem around periodic orbits*, **Journal of Differential Equations** 268, pages 3749-3780, 2020
DOI: 10.1016/j.jde.2019.10.013
2. S. Barbieri, *On the algebraic properties of exponentially stable integrable Hamiltonian systems*, **Annales de la Faculté des Sciences de Toulouse**, 31(5), pages 1365-1390, 2022
DOI: 10.5802/afst.1723
3. S. Barbieri, J.-P. Marco, J. E. Massetti *Analytic smoothing and Nekhoroshev estimates for Hölder steep Hamiltonians*, **Communications in Mathematical Physics**, 396(1), pages 349-381, 2022
DOI: 10.1007/s00220-022-04464-0
4. S. Barbieri, L. Niederman *Bernstein-Remez inequality for algebraic functions: a complex analytic approach*, **Nonlinear Analysis**, 237, 113371, 2023
DOI: 10.1016/j.na.2023.113371
5. S. Barbieri, G. Farré, *Nearly-optimal effective stability estimates around Diophantine tori of Hölder Hamiltonians*, **Journal of Dynamics and Differential Equations** 37, pages 3185–3196, 2024
DOI: 10.1007/s10884-024-10397-0
6. S. Barbieri, L. Biasco, L. Chierchia, D. Zaccaria, *Singular KAM Theory for Convex Hamiltonian Systems*, **Regular and Chaotic Dynamics** 30(4) (Celebrating the 75th Birthday of V.V. Kozlov), pages 538-549, 2025. DOI: 10.1134/S1560354725040057
7. S. Barbieri, *Semi-algebraic geometry and generic Hamiltonian stability*, **Advances in Mathematics** 482(C), 110643, 2025
DOI: 10.1016/j.aim.2025.110643
8. S. Barbieri, A. Clarke, *Existence and Nonexistence of Invariant Curves of Coin Mappings*, **Nonlinearity**, 38(12), 2025
DOI: 10.1088/1361-6544/ae2374

Preprints

9. D. Bambusi, S. Barbieri, M. Giralt, B. Langella, *Nekhoroshev Theorem for time quasiperiodic perturbations of P-Steep systems*,
<https://arxiv.org/pdf/2606.30841v1>
10. S. Barbieri, *The dodecahedron, the allegory of the cave, and the square root of two*,
<https://hal.science/hal-05687903>

Fields of research

1. **Nearly-integrable Hamiltonian systems.** Genericity of global long-time stability of solutions (Nekhoroshev Theory) and its relationships with real-algebraic geometry and number theory. Optimality of the times of stability. Study of the measure of the set of perpetually stable orbits in these systems (KAM Theory). Applications to Celestial Mechanics, in particular to the three-body problem.
2. **Discrete dynamical systems.** Billiard mappings with delay functions and their connections to geodesic flows on suitable singular surfaces. Research of both invariant curves and of chaotic motions in these systems, and related rigidity properties.

Accreditations

- **Research evaluation merit** - Catalan Agency for Academic Evaluation (AQU)
- **Associate professor in pure and applied mathematics** - French University System

Grants

Jan-2027	Dinámica: Análisis, Computación, Aplicaciones (DACA) (PI prof. M. Guàrdia, prof. A. Haro) <i>Research group member - PID2025-174015NB-I00</i>
June-2024	Juan de la Cierva Research Grant <i>Universitat Politècnica de Catalunya</i>
April-2023	Winner of the International Program for Research Groups (IP4RG) together with Prof. Marcel Guàrdia (U. de Barcelona) and Dr. Jessica Massetti (U. degli studi di Roma Tor Vergata) <i>Centre de Recerca Matemàtica</i>

Teaching

2026-2027	Foundations of Mathematics I (72h), 1st year, BA in Biomedical and Chemical Engineering <i>Universitat de Girona</i>
2025-2026	Foundations of Mathematics II (72h), 1st year, BA in Biomedical, Chemical, Electrical, and Mechanical Engineering <i>Universitat de Girona</i>
-	Foundations of Mathematics I (72h), 1st year, BA in Biomedical and Chemical Engineering <i>Universitat de Girona</i>
2024-2025	Calculus II (Part on differentiation - 28h), 1st year, BA of Industrial Technologies and Economic Analysis (GTIAE) <i>Universitat Politècnica de Catalunya</i>
2023-2024	Calculus II (Part on differentiation - 28h), 1st year, BA of Industrial Technologies and Economic Analysis (GTIAE) <i>Universitat Politècnica de Catalunya</i>
2022-2023	Calculus I (88h), 1st year, BA of Mathematics and Computer Science <i>Université Paris Dauphine</i>
2021-2022	Elements of Mathematics I (64h), 1st year, Technical University Diploma (DUT) in Chemistry <i>IUT Orsay - Université Paris Saclay</i>
2020-2021	Elements of Mathematics II (64h), 2nd year, Technical University Diploma (DUT) in Chemistry <i>IUT Orsay - Université Paris Saclay</i>
2019-2020	Elements of Mathematics I (64h), 1st year, Technical University Diploma (DUT) in Chemistry <i>IUT Orsay - Université Paris Saclay</i>

Thesis supervisions

2023-2024 Master thesis of D. Zaccaria
Some developments in Singular KAM theory
Co-supervised together with L. Biasco and L. Chierchia
Università degli Studi Roma Tre

Participation to projects

From Jan 2027 - *Dinámica: Análisis, Computación, Aplicaciones (DACA) (PI prof. M. Guàrdia, prof. A. Haro) - Research group member*
PID2025-174015NB-I00

Nov 2025 - Now *Enfoque riguroso y computacional en el estudio de las variedades invariantes con aplicaciones a la mecanica celeste (PI prof. T. Seara) - Working group member*
PID2024-158570NB-I00

Jun to Dec - 2024 *Métodos analíticos y computacionales en sistemas dinámicos*
PID 2021-125535NB-I00 (PI prof. A. Jorba, prof. A. Haro) - Working group member
<https://futur.upc.edu/34856932>

Jan to Dec - 2024 *Premi ICREA 2018 (PI prof. M. Guàrdia) - Working group member*
https://memoir.icrea.cat/academia_awardees/guardia-munarriz-marcel/

June to Dec - 2023 *ERC Project 757802 Haminstab (PI prof. M. Guàrdia)*
<https://www.ub.edu/dynsys/grants/haminstab/>

Other academic activities

Oct - 2026 *Co-organizer of the congress Barcelona Mathematical Days*

2026 - Now *Member of the Catalan Mathematical Society (SCM)*

2025 - Now *Reviewer for Mathematical Reviews Database (Mathscinet)*

2024 - Now *Reviewer for the journals: Nonlinearity, Journal of Differential Equations, Communications in Nonlinear Science and Numerical Simulation*

2025 - Now *Member of the Unidignitat committee against discriminations and for the well-being of academic workers*
Universitat de Girona

2019 - 2021 *Assistance to a student with special needs (30h)*
Service for the disabled - Université Paris-Saclay

2018 - 2019 *Representative of the PhDs and of the postdocs at the Academic committee against discriminations and for the well-being of academic workers*
Universita degli Studi di Padova, Padova, Italy

2018 - 2019 *Representative of the PhDs at the Academic committee of PhD courses*
Universita degli Studi di Padova, Padova, Italy

Training courses attended

2025 - 2026	<i>Docencia Universitària Formació inicial - DUFI (35h)</i> Universitat de Girona
2025 - 2026	<i>Safety and well-being at work (2h)</i> Universitat de Girona
2025 - 2026	<i>The compromise of the university with environmental sustainability (2h)</i> Universitat de Girona
2024 - 2025	<i>Dealing with patients suffering from severe mental issues (30h)</i> Catalan Association of Family Members of Patients with Mental Issues (AFAMMCA) - Catalan Association of Family Members of Patients with Schizophrenia (ACFAMES)

Scientific disclosure

I am the author of two science popularization papers for SCM Notícies and Butlletí de la Societat Catalana de Matemàtiques, and I keep collaborating on projects of scientific popularization for the Catalan Mathematical Society (see the list of publications above).

I also collaborate with the *Casa de la cultura de Girona* and with the *Càtedra Lluís Santaló* of the University of Girona in events aimed at popularizing mathematics.

<https://www.casadecultura.org/detall/42532/conferencia-juguem-a-billar-amb-edvard-munch-i-henri-poincare-amb-santiago-barbieri->

Seminars and conferences

2026 - September	2nd ISTA Summer School in Dynamical Systems (contributed talk) https://dynamics-summerschool.pages.ist.ac.at/ <u>BIFED, Strobl, Austria</u>
2026 - September	Dynamical systems seminar https://65e2503895b77.site123.me/upcoming-seminars <u>University of Padova, Italy</u>
2026 - February	CSASC-2026 - Joint meeting and conference of the Czech, Slovenian, Austrian, Slovak and Catalan Mathematical Societies https://csasc2026.zcu.cz/ <u>University of West Bohemia, Plzeň, Czech Republic</u>
2025 - November	DynamIST Seminar https://dynamist.pages.ist.ac.at/ <u>Institute for Science and Technology Austria (ISTA), Klosterneuburg, Austria</u>
2025 - July	Workshop on billiards and quantitative symplectic geometry https://sites.google.com/view/hd-billiard-and-symplectic/home <u>Universität Heidelberg, Germany</u>
2025 - June	Nolineal 2025 http://www.itmati.com/nolineal25/home <u>Universidade de Santiago de Compostela, Spain</u>
2025 - March	Seminar on interactions between PDEs and Dynamical Systems https://sites.google.com/view/analysis-wg-unito/home-page <u>Università degli studi di Torino, Italy</u>

2025 - February	Seminar of Dynamical Systems UB-UPC http://www.maia.ub.es/ssd/ssd-prev.shtml <u>Universitat Politècnica de Catalunya, Barcelona, Spain</u>
2024 - May	Seminar of Algebraic Geometry UB http://www.ub.edu/sga/seminari2324.htm <u>Universitat de Barcelona, Barcelona, Spain</u>
2024 - January	Séminaire Géométrie, Analyse et Dynamique https://math.univ-cotedazur.fr/emilition/seminaire/seminar.php <u>Université de la Côte d'Azur, Nice, France</u>
2023 - December	Quantum and Dynamical Christmas in Milano https://qdc2023.unimi.it/ <u>Università degli studi di Milano, Italy</u>
2023 - November	Aspects mathématiques de la mécanique celeste et Hamiltonienne https://perso.imcce.fr/alain-albouy/Avignon2023.html <u>Avignon Université, France</u>
2023 - May	International school on conformally symplectic dynamics https://conferences.cirm-math.fr/2878.html <u>CIRM, Marseille, France</u>
2022 - July	Conference GLADS 2022 https://www.crm.cat/glads-22/ <u>Centre de Recerca Matemàtica, Barcelona, Spain</u>
2022 - April	Seminario de sistemas dinâmicos Universidade Federal Rural de Pernambuco, Recife, Brazil
2022 - March	Séminaire SYMPA https://lamfa.u-picardie.fr/SymPA/seminaire/2022 <u>Université de Picardie Jules Verne, Amiens, France</u>
2022 - January	Séminaire de Systèmes Dynamiques, Analyse et Géométrie https://math.univ-avignon.fr/seminaires/seminaire-de-systemes-dynamiques-analyse-geometrie/ <u>Avignon Université, Avignon, France</u>
2022 - January	Working group in Hamiltonian and symplectic dynamics of Jussieu-Dauphine https://annaflorimath.wordpress.com/working-group-2021-2022/ <u>Sorbonne Université, Université Paris-Dauphine, France</u>
2022 - January	Working group of dynamical systems and ergodic theory https://www.imo.universite-paris-saclay.fr/thierry.bousch/tesd/arc2122.html <u>Université Paris-Saclay, Orsay, France</u>
2021 - December	Seminar of dynamical systems of UB-UPC http://www.maia.ub.es/ssd/ssd.21-22.shtml <u>Universitat Politècnica de Catalunya, Barcelona, Spain</u>
2021 - October	Working group in Hamiltonian and symplectic dynamics of Dauphine-Jussieu https://annaflorimath.wordpress.com/working-group-2021-2022/ <u>Sorbonne Universités, Paris, France</u>
2021 - July	Working group in dynamical systems of Roma Tre Università degli Studi Roma Tre, Italy
2020 - March	Seminar of PhD students of Université Paris-Dauphine Université Paris Dauphine, Paris, France

- 2019 - March** Seminar of Analysis and Dynamical systems
<https://crm.sns.it/course/6021/>
Centro Ennio De Giorgi - Scuola Normale Superiore, Pisa, Italy
- 2018 - October** Seminar of Dynamical systems
Università degli Studi di Milano, Italy
- 2018 - September** Conference AMC_{70}
<http://adams.dm.unipi.it/~2018amc70>
Università di Pisa, Italy
- 2018 - June** Conference: perspectives in Hamiltonian Dynamics (Venezia, Italy)
<https://events.math.unipd.it/ercvenice/>
Università degli Studi di Padova, Italy
- 2017 - March** Groupe de travail sur le problème des N-corps
<https://www.ceremade.dauphine.fr/~fejoz/nbp.php>
Observatoire de Paris, France