

Alberto Bonicelli

Curriculum Vitae

LPSM
Sorbonne Université
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📄 [Personal webpage](#)
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Latest update: March 9, 2026

Citizenship Italian

Language Italian (native language), English (excellent), French (good)

Scientific interests

Mathematical physics Algebraic quantum field theory, renormalization

Mathematics Stochastic partial differential equations, microlocal analysis, regularity structures

Professional experience & Education

From Oct. 2024 - **Postdoc**, LPSM Sorbonne, FSMP Fellowship, Supervisor: Prof. Lorenzo Zambotti.

Oct. 2021 - Jan. 2025 - **PhD in mathematical physics**, University of Pavia, Department of Physics, Supervisor: Prof. Claudio Dappiaggi, Co-supervisor: Prof. Nicolò Drago.
Thesis: Algebraic methods for the perturbative analysis of stochastic differential equations.

Oct. 2019 - Sept. 2021 - **Masters's Degree in Theoretical Physics**, University of Pavia, Summa cum Laude, Supervisors: Prof. Claudio Dappiaggi, Dr. Paolo Rinaldi.
Thesis: A microlocal approach to the stochastic nonlinear Schrödinger equation.

Publications

[Link to my Google Scholar page.](#)

- 2025 **A. B.**, *Exotic B-series representation of the Feller semigroup for Itô diffusions and the MSR path integral*, [arXiv preprint](#).
- 2025 **A. B.**, **C. Dappiaggi**, **N. Drago**, *An algebraic correspondence between stochastic differential equations and the Martin-Siggia-Rose formalism*, [Annales Henri Poincaré](#).
- 2024 **A. B.**, **C. Dappiaggi**, **P. Rinaldi**, *On the stochastic Sine-Gordon model: an interacting field theory approach*, [Communications in Mathematical Physics](#), 405, 288.
- 2024 **A. B.**, **B. Costeri**, **C. Dappiaggi**, **P. Rinaldi**, *A microlocal investigation of stochastic partial differential equations for spinors with an application to the Thirring model*, [Mathematical Physics, Analysis and Geometry](#), 27 (3), 1-52.
- 2023 **A. B.**, **C. Dappiaggi**, **P. Rinaldi**, *An algebraic and microlocal approach to the stochastic nonlinear Schrödinger equation*, [Annales Henri Poincaré](#), 24, 2443–2482.

Other writings

- 2025 **A. B.**, *Algebraic methods for the perturbative analysis of stochastic equations*, PhD Thesis.
- 2023 **A. B., F. Zanella**, *Holder-Besov spaces and space-time white noise*, Oberwolfach Reports. Arbeitsgemeinschaft: QFT and Stochastic PDEs .

Talks

Invited talks

- 2 Feb. 2026 **La rivoluzione dell'analisi stocastica pathwise**, *PRISMA seminar*, online. with Lorenzo Zambotti
- 13 Gen. 2026 **The semigroup of an Itô diffusion as an exotic B-series**, *Pavia*, Renormalization from Quantum Field Theory to Statistical Mechanics and Complex Systems.
- 8 Gen. 2026 **Representation of the semigroup for Itô diffusions via (multi-indices) exotic B-series and Feynman diagrams**, *Department of mathematics*, University of Trento.
- 4 Dec. 2025 **Representation of the semigroup for Itô diffusions via (multi-indices) exotic B-series and Feynman diagrams**, *Institute Elie Cartan*, Université de Lorraine, Operads, Symmetries for QFT and Singular SPDEs.
- 3 Oct. 2025 **Path integral expectation for 1-D Itô diffusions**, *LPSM*, Sorbonne Université, GdT "les probas du vendredi".
- 28 May 2024 **An interactive field approach to the stochastic sine-Gordon model**, *Institute Elie Cartan*, Université de Lorraine, Decorated Tree-like structures for singular dynamics.
- 22 May 2024 **An interactive field approach to the stochastic sine-Gordon model**, *Department of mathematics*, Université de Bretagne occidentale, Rencontre ANR Smooth 2024.
- 16 Apr. 2024 **Convergence results in the stochastic sine-Gordon model: An algebraic viewpoint**, *Department of mathematics*, University of Potsdam.
- 5 Dec. 2022 **Stochastic nonlinear Schrödinger equation from an algebraic and microlocal viewpoint**, *Department of mathematics*, University of Genova.
- 1 Dec. 2022 **Stochastic nonlinear Schrödinger equation, an algebraic point of view**, *Department of mathematics*, University of Trento.
- 13 Oct. 2022 **Algebraic formulation of the SDE-Path integral correspondence**, *Department of mathematics*, University of Trento.

Contributed talks

- 27 Nov. 2024 **Renormalization, an extension problem**, *Analytical methods in interplay with physics*, A workshop to explore Asymptotics, Randomness and Noncommutativity, University of Potsdam.
- 2 July 2024 **A quantum field theory perspective on singular stochastic PDEs**, *52th Saint-Flour probability summer school*.
- 18 Dec. 2023 **Functional spaces and the regularity of space-time white noise**, *Oberwolfach Arbeitsgemeinschaft*, QFT and stochastic PDEs.

- 19 Sept. 2023 **What if Quantum Field Theory meets complex systems?**, *PhD end-of-year seminar*, II year.
- June. 2023 **Deterministic and Probabilistic Dynamics of Nonlinear Dispersive PDEs**, *Maxwell Institute for Mathematical Sciences*, Edinburgh, (Poster).
- Sept. 2022 **A microlocal and algebraic approach to SPDEs**, *XLVII Summer school on mathematical physics - GNFM*, Ravello.
- 30 Oct. 2022 **A complex world**, *PhD end-of-year seminar*, I year.

Fellowships and awards

- 2024 **FSMP PostDoc fellowship**, 2-year fellowship founded by the Fondation Sciences Mathématiques de Paris.
- 2024 **MathInGreaterParis fellowship**, Postdoctoral fellowship cofunded by Marie Skłodowska-Curie Actions H2020-MSCA-COFUND-2020.
Declined
- 2023 **Bando Cassini**, founded by Institut Francais Italia and Laboratory Ypatia of Mathematical Sciences.
- 2023 **Progetto giovani GNFM**, *Feynman propagator for Dirac fields: a microlocal analytic approach*, founded by Gruppo Nazionale di Fisica Matematica.
- 17/02/22 **Premio Grazioli**, *Istituto Lombardo Accademia di Scienze e Lettere*.

Attended Workshops and Schools

- 3-5 Dec. 2025 **Operads, Symmetries for QFT and Singular SPDEs**, *Institute Elie Cartan*, Université de Lorraine.
- 20-24 Oct. 2025 **New trends of stochastic nonlinear systems: well-posedness, dynamics and numerics**, CIRM, Marseille.
- 16-27 Jun. 2025 **Summer school: PDEs and probability**, *Laboratoire JaquesLouis Lions*, Sorbonne université, Paris.
- 24-28 Mar. 2025 **YMCN Spring School: Recent Advances in SPDEs**, *Department of mathematics*, Münster.
- 4-6 Dec. 2024 **Singular SPDEs, invariant measures and discrete models**, *Institute Elie Cartan*, Nancy.
- 27-29 Nov. 2024 **Analytical methods in interplay with physics**, *A workshop to explore Asymptotics, Randomness and Noncommutativity*, Potsdam.
- 01-13 Jul. 2024 **52th Probability summer school**, *Saint-Flour, France*.
- 27-29 May 2024 **Decorated Tree-like structures for singular dynamics**, *Université de Lorraine*.
- 22-24 May 2024 **Rencontre ANR Smooth 2024**, *Université de Bretagne occidentale*.
- 8-12 Apr. 2024 **Curved spacetimes, field theory and beyond**, *Paris*, Institute Henri Poincaré.

- 18-22 Dec. 2023 **Oberwolfach Arbeitsgemeinschaft**, QFT and stochastic PDEs.
- 4-6 Oct. 2023 **Panorama of mathematics II**, Hausdorff Center for Mathematics, Bonn.
- 30 Jun. 2023 **Higher structures in geometry and mathematical physics**, *thematic programme*, Institut Henri Poincaré, Paris.
- 26 - 28 Jun. 2023 **Frontiers in mathematical physics**, *Cergy*, CY Cergy Paris Université.
- 14 - 16 Jun. 2023 **Deterministic and probabilistic dynamics of nonlinear dispersive PDEs**, *Edinburgh*, Maxwell institute for mathematical sciences, I presented a poster.
- 6 - 8 Feb. 2023 **Universality in Condensed Matter and Statistical Mechanics**, *Rome*, Università degli Studi Roma Tre (online).
- 12 - 24 Sep. 2022 **Summer school - XLVII summer school in mathematical physics**, *Ravello*, INdAM, GNFN.
- 24 - 25 Jun. 2022 **46-th LQP meeting**, FAU Erlangen-Nürnberg.
- 29 Nov. - 03 Dec. 2021 **Winter school - Analytical methods in quantum and continuum mechanics**, *Department of Mathematics*, Politecnico of Torino.

Organized conferences

- 11-12 Jan. 2024 **Common trends and challenges in QFT and stochastic PDEs**, *Pavia*, Principal investigator.
<https://sites.google.com/view/spdesqft/home>

Short visits

- Oct. 2023 - Jul. 2024 **Research visit**, *Invited by Prof. Lorenzo Zambotti*, LPSM Sorbonne.
- 28 may - 17 June 2023 **Research visit**, *Invited by Prof. Matteo Capoferri*, Department of mathematics, Heriot-Watt University, Edinburgh.
- 2022-2023 **Research activity with Prof. Simone Murro**, *Department of mathematics*, University of Genova.
- 2021-2022 **Research activity with Prof. Nicolò Drago**, *Department of mathematics*, University of Trento.

Thesis supervision

- 2023 **Beatrice Costeri**, *University of Pavia*, *Master's degree in physics*, A microlocal approach to the stochastic nonlinear Dirac equation, Summa cum Laude.
 Co-supervisor with Claudio Dappiaggi and Paolo Rinaldi
- 2023 **Raman Deep Sing**, *University of Pavia*, *Bachelor degree in physics*, Local Fundamental Solutions of the Wave Operator on Lorentzian Manifolds, Summa cum Laude.
 Co-supervisor with Claudio Dappiaggi

Professional development activities

Teaching activities

- 2024-2025 **Mathématiques pour les études scientifiques**, 38 Hours, *B.Sc. in mathematics and informatics*, Sorbonne Université.
- 2022-2023 **Seminars for the class of Mathematical Methods of Physics I**, (Prof. Barbara Pasquini), 15 Hours, *B.Sc. in Physics*, University of Pavia.
- 2022-2023 **Seminars for the class of Mathematical Methods of Physics II**, (Prof. Claudio Dappiaggi), 10 Hours, *B.Sc. in Physics*, University of Pavia.
- 2021-2022 **Seminars for the class of Mathematical Methods of Physics I**, (Prof. Barbara Pasquini), 10 Hours, *B.Sc. in Physics*, University of Pavia.
- 2021-2022 **Course on tensor calculus**, 10 hours, *Almo collegio Borromeo*, Pavia.
- 2021-2022 **Seminars for the class of Mathematical Methods of Physics II**, (Prof. Claudio Dappiaggi), 10 Hours, *B.Sc. in Physics*, University of Pavia.
- 2020 - 2021 **Tutor of General Physics**, 15 Hours, *CTF first year class*, University of Pavia.