

Alberto Bonicelli

Curriculum Vitae

Faculty of Physics
University of Pavia
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📄 [Personal webpage](#)
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Latest update: July 15, 2024

Birth Alzano Lombardo (BG), 27/05/97

Citizenship Italian

Language Italian (native language), English (B2 level, First certificate)

I am a **young researcher**, eager for challenging opportunities and new collaborations worldwide. As a PhD student I am specializing on **mathematical aspects of quantum field theory** and how they can be applied to completely different fields, such as singular PDEs driven by rough sources. My academic journey is teaching me how to **work in a team**, how to **independently manage scientific tasks** and the importance of **teaching activities**.

Scientific interests

Mathematical physics Algebraic quantum field theory, renormalization

Mathematics Stochastic partial differential equations, microlocal analysis

Strengths

- Independent organization and management of a research project
- Teaching experience
- In-dept knowledge of advanced topics in microlocal analysis and AQFT, as well as in algebraic renormalization.
- Administrative duties management (Ph.D students representative)

Professional experience & Education

From Oct. 2023 **Visiting PhD student**, *LPSM Sorbonne*, Supervisor: Prof. Lorenzo Zambotti.

From Oct. 2021 **PhD student in mathematical physics**, *University of Pavia*, Department of Physics, Supervisor: Prof. Claudio Dappiaggi, Co-supervisor: Prof. Nicolò Drago.

From 2022 **PhD student representative**, *Department of Physics*, University of Pavia.

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

Oct. 2016 - **Bachelor's Degree in Physics**, *University of Pavia*, Summa cum Laude, Supervisor:
Sept. 2019 Prof. Claudio Dappiaggi, Dr. Paolo Rinaldi.
Thesis: Geodesic Motion on Riemannian Manifolds from Heat Kernel Techniques

Publications

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

- 2023 **A. B., C. Dappiaggi, P. Rinaldi**, *On the stochastic Sine-Gordon model: an interacting field theory approach*, [ArXiv preprint](#).
- 2023 **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*, [ArXiv preprint](#).
- 2023 **A. B., C. Dappiaggi, N. Drago**, *An algebraic correspondence between stochastic differential equations and the Martin-Siggia-Rose formalism*, [ArXiv preprint](#).
- 2023 **A. B., C. Dappiaggi, P. Rinaldi**, *An algebraic and microlocal approach to the stochastic nonlinear Schrödinger equation*, Annales Henri Poincaré, [Link](#).

Talks

Contributed talks

- 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.

Invited talks

- 13 Oct. 2022 **Algebraic formulation of the SDE-Path integral correspondence**, *Department of mathematics*, University of Trento.
- 1 Dec. 2022 **Stochastic nonlinear Schrödinger equation, an algebraic point of view**, *Department of mathematics*, University of Trento.
- 5 Dec. 2022 **Stochastic nonlinear Schrödinger equation from an algebraic and microlocal viewpoint**, *Department of mathematics*, University of Genova.
- 16 Apr. 2024 **Convergence results in the stochastic sine-Gordon model: An algebraic viewpoint**, *Department of mathematics*, University of Potsdam.
- 22 May 2024 **An interactive field approach to the stochastic sine-Gordon model**, *Department of mathematics*, Université de Bretagne occidentale, Rencontre ANR Smooth 2024.
- 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.

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 Français 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

- 29 Nov. - 03 Dec. 2021 **Winter school - Analytical methods in quantum and continuum mechanics**, *Department of Mathematics*, Politecnico of Torino.
- 24 - 25 Jun. 2022 **46-th LQP meeting**, FAU Erlangen-Nürnberg.
- 12 - 24 Sep. 2022 **Summer school - XLVII summer school in mathematical physics**, *Ravello*, INdAM, GNFM.
- 6 - 8 Feb. 2023 **Universality in Condensed Matter and Statistical Mechanics**, *Rome*, Università degli Studi Roma Tre (online).
- 14 - 16 Jun. 2023 **Deterministic and probabilistic dynamics of nonlinear dispersive PDEs**, *Edinburgh*, Maxwell institute for mathematical sciences, I presented a poster.
- 26 - 28 Jun. 2023 **Frontiers in mathematical physics**, *Cergy*, CY Cergy Paris Université.
- 30 Jun. 2023 **Higher structures in geometry and mathematical physics**, *thematic programme*, Institut Henri Poincaré, Paris.
- 4-6 Oct. 2023 **Panorama of mathematics II**, Hausdorff Center for Mathematics, Bonn.
- 18-22 Dec. 2023 **Oberwolfach Arbeitsgemeinschaft**, QFT and stochastic PDEs.
- 8-12 Apr. 2024 **Curved spacetimes, field theory and beyond**, *Paris*, Institute Henri Poincaré.
- 22-24 May 2024 **Rencontre ANR Smooth 2024**, *Université de Bretagne occidentale*.
- 27-29 May 2024 **Decorated Tree-like structures for singular dynamics**, *Université de Lorraine*.
- 01-13 Jul. 2024 **52th Probability summer school**, *Saint-Flour, France*.

Orgaized 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

- 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

- 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.