Paolo Rinaldi

Curriculum vitae

Dipartimento di Fisica
Università di Pavia
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Last Update: July 2021

Personal Data

Birth	San Giovanni Bianco (BG), 27/05/1994
Nationality	Italian
Spoken Language	Italian (mother tongue), English

Present Position

October 2018- **Ph.D. student in Mathematical Physics**, *University of Pavia*, Physics Department, Supervisor: Prof. Claudio Dappiaggi.
Students Representatives from 2020

Education

7 may 2019 **Second Level Diploma**, *IUSS, institute for advanced study in Pavia*, Grade: Excellent, Supervisors: Prof. Claudio Dappiaggi, Dr. Nicolò Drago.
Thesis: Diffusive Processes from an Algebraic Quantum Field Theory Viewpoint

Oct. 2016 - Sept. 2018 **Master's Degree in Physics**, *Università degli studi di Pavia*, Summa Cum Laude, Supervisors: Prof. Mauro Carfora, Prof. Claudio Dappiaggi, Dr. Nicolò Drago.
Thesis: Ricci Flow From Euclidean Renormalization Group Techniques, Date of Defense: September 27, 2018

20 october 2016 **First Level Diploma**, *IUSS, institute for advanced study in Pavia*, Grade: Excellent, Supervisor: Dr. Claudio Dappiaggi.
Thesis: C^*- and von Neumann Algebras: Structural Aspects of the Observables of a Quantum System

Oct. 2013 - Jul. 2016 **Bachelor's Degree in Physics**, *Università degli studi di Pavia*, *Summa Cum Laude*, Supervisor: Dr. Claudio Dappiaggi.
Thesis: Criteri per l'Identificazione di Osservabili in Meccanica Quantistica (Transl: Criteria for the Identification of the Observables in Quantum Mechanics), Date of Defense: July 21, 2016

2013-2018 **Alumnus**, *Almo Collegio Borromeo*, Pavia, Italy.

2013-2018 **Fellow**, *IUSS*, Institute for Advanced Study in Pavia, Italy.

2013 **Maturità Scientifica (High School Diploma)**, *Istituto Superiore D.M. Turoldo*, Zogno (BG, Italy), mark 100/100.

Scientific Interests

Mathematical Physics: (Algebraic) Quantum Field Theory, Renormalization, General Relativity

Pure Mathematics: Stochastic PDEs, Microlocal Analysis, Geometric Analysis

Honors, Prizes and Scolarships

June. 2020 **Premio Luigi Berzolari 2020**, *University of Pavia*, Pavia, Prize for the best master thesis of mathematical argument.

Jul. 2019 **Miglior Laureato in Fisica**, *Award for the best Physics student (graduation) of the academic year 2017/2018*, University of Pavia, Pavia.

Feb. 2019 **Grazioli Prize**, *Istituto Lombardo Accademia di Scienze e Lettere*.

2018 **Winner of a Ph.D. position (with scholarship) in Physics**, *Department of Physics*, University of Pavia.

2018 **Winner of a Ph.D. position (with scholarship) in Mathematics**, *Department of Mathematics*, University of Genoa, *refused*.

2017 ***Mons. Giuseppe Angelini* Prize**, *Associazione Alunni Almo Collegio Borromeo*, Pavia.

2013-2018 **Five-years IUSS Scholarship**, *Five years scholarship granted by the IUSS (Institute for Advanced Study in Pavia) to the best students of the University of Pavia*, subject to annual reconfirmation.

Preprints

2021 **C. Dappiaggi, PR, F. Sclavi**, "On a Microlocal Version of Young's Product Theorem", arXiv: 2104.12423 [math-ph].

Publications

2021 **C. Dappiaggi, N. Drago, PR, L. Zambotti**, "A Microlocal Approach to Renormalization in Stochastic PDEs", To Appear in Communications in Contemporary Mathematics, arXiv: 2009.07640 [math-ph].

2021 **PR, F. Sclavi**, 'Reconstruction Theorem for Germs of Distributions on Smooth Manifolds", Journal of Mathematical Analysis and Applications, Vol 501, Issue 2, https://doi.org/10.1016/j.jmaa.2021.125215, arXiv:2012.01261 [math-ph].

2020 **C. Dappiaggi, N. Drago, PR**, "The Algebra of Wick Polynomials of a Scalar Field on a Riemannian Manifold", Reviews in Mathematical Physics, Vol. 32, No. 08 2050023, https://doi.org/10.1142/S0129055X20500233, arXiv: 1903.01258 [math-ph].

2020 **M. Carfora, C. Dappiaggi, N. Drago and PR**, "Ricci Flow from the Renormalization of Nonlinear Sigma Models in the Framework of Euclidean Algebraic Quantum Field Theory", Communications in Mathematical Physics, 374, 241–276 (2020) https://doi.org/10.1007/s00220-019-03508-2, arXiv:1809.07652 [math-ph].

Talks

29 Jul. 2021 **A Microlocal Approach to Renormalization in Stochastic PDEs**, *Young Reseach Symposium – ICMP 2021*, Geneva, (online talk).

23 Feb. 2021 **A Microlocal Approach to Non-Linear Stochastic PDEs**, *Se mi narri di Matematica*, Dipartimento di Matematica - University of Pavia, **(Invited)**.

1 Oct. 2020 **Renormalizing Stochastic PDEs**, *Ph.D. Seminars*, Physics Department - University of Pavia.

29 Nov. 2019 **Ricci Flow from Euclidean Algebraic Quantum FIeld Theory**, *Mathematical Physics Seminar*, Institute of Mathematics - University of Würzburg, **(Invited)**.

8 Nov. 2019 **Ricci Flow from the Renormalization of Nonlinear Sigma Models in the Framework of Euclidean Algebraic Quantum Field Theory**, *MYR Meeting*, Math Young Researchers Meeting, Maths Department - University of Genova.

14 Oct. 2019 **A New Viewpoint on Singular Stochastic PDEs**, *Ph.D. Seminars*, Physics Department - University of Pavia.

6 Sept. 2019 **Ricci Flow from Nonlinear Sigma Models**, *XLIV Summer School on Mathematical Physics*, Gruppo Nazionale Fisica Matematica (GNFM), Ravello, Italy.

16 Apr. 2019 **The Algebra of Wick Polynomials of a Scalar Field on a Riemannian Manifold**, *Algebraic and Geometric Aspects in Quantum Field Theory*, Mathematical Institute, Universität Freiburg, Freiburg im Breisgau, Germany.

21 Feb. 2018 **Ricci Flow from Euclidean Algebraic Quantum FIeld Theory**, *43rd LQP Workshop*, Galileo Galilei Institute, Florence, Italy.

Attended Workshops and Schools

2-7 aug. 2021 **Internation Congress on Mathematical Physics – ICMP 2021**, *Geneva*, (Online attendee).

29-31 jul. 2021 **Young Research Symposium – ICMP 2021**, *Geneva*, (Online attendee).

12-16 oct. 2020 **Higher Structures Emerging from Renormalisation**, *Erwin Schrödinger Institute*, Wien, Online Workshop.

17-19 june 2020 **45th LQP Workshop - Foundations and Constructive Aspects of QFT**, *Institute for Theoretical Physics*, Online Workshop.

4-7 Dec. 2019 **Quantum Field Theory Meets Quantum Probability**, *Department of Mathematics*, University of Rome Tor Vergata.

8 Nov. 2019 **MYR Meeting**, *Math Young Researchers Meeting*, Maths Department - University of Genova.

25-26 oct. 2019 **44th LQP Workshop - Foundations and Constructive Aspects of QFT**, *Institute for Theoretical Physics*, Göttingen.

02-14 sept. 2019 **XLIV Summer School on Mathematical Physics**, *Organized by Gruppo Nazionale Fisica Matematica (GNFM)*, Ravello, Italy.

20-24 may 2019 **Hypoelliptic Laplacian and Applications**, *Mathematical Institute, Universität Freiburg*, Freiburg im Breisgau, Germany.

15-18 apr. 2019 **Algebraic and Geometric Aspects in Quantum Field Theory**, *Mathematical Institute, Universität Freiburg*, Freiburg im Breisgau, Germany.

20-22 feb. 2019 **43rd LQP Workshop - Foundations and Constructive Aspects of QFT**, *Galileo Galilei Institute*, Firenze.

Short Visits

24-30 Nov. 2019 **Dr. Nicolò Drago**, *Institute of Mathematics*, University of Würzburg.

Teaching

2020-2021 **Seminars on Complex Analysis (10 hours)**, *for the class of Mathematical Methods of Physics I (Prof. Barbara Pasquini) of the B.Sc. in Physics*, Università di Pavia.

March 2020 **Introduction to Microlocal Analysis (10 hours)**, *Introduzione all'Analisi Microlocale*, Almo Collegio Borromeo, Pavia.

2019-2020 **Seminars on Spectral Theory and Distribution Theory (12 hours)**, *for the class of Mathematical Methods of Physics II (Prof. Claudio Dappiaggi) of the B.Sc. in Physics*, Università di Pavia.

2018-2019 **Seminars on Complex Analysis (12 hours)**, *for the class of Mathematical Methods of Physics I (Prof. Barbara Pasquini) of the B.Sc. in Physics*, Università di Pavia.

2018-2019 **Seminars on Spectral Theory and Distribution Theory (12 hours)**, *for the class of Mathematical Methods of Physics II (Prof. Claudio Dappiaggi) of the B.Sc. in Physics*, Università di Pavia.

November 2018 **Course on Tensorial Calculus (10 hours)**, *Introduzione al Calcolo Tensoriale*, Almo Collegio Borromeo, Pavia.

2018- **Tutor for the area of Mathematics and Physics**, *Academic assistance to students and seminars*, Almo Collegio Borromeo, Pavia.

2017-2018 **Tutor of Classical Mechanics**, *15 hours*, class of the B.Sc. in Physics, Università di Pavia.

Thesis Co-Supervisor

2021 **Alberto Bonicellii**, *A Microlocal Approach to the Stochastic Non-Linear Schrödinger Equation*, Università di Pavia, MSc. in Physics, Co-supervisor.

2021 **Diego Salvi**, *TBA*, Università di Pavia, MSc. in Physics, Co-supervisor.

Sept. 2020 **Nicolò Nuca**, *Processi di Diffusione ed Equazione di Fokker-Planck*, Università di Pavia, BSc. in Physics, 106/110, Co-supervisor.

Sept. 2019 **Alberto Bonicelli**, *Geodesics motion on Riemannian manifolds from heat flow techniques*, Università di Pavia, BSc. in Physics, 110/110 cum laude, Co-supervisor.

Research Projects

2019 **Progetto Giovani GNFM**, *"Factorization algebras vs AQFTs on Riemannian manifolds"*, Principal Inverstigator: Dr. Marco Benini (Dipartimento di Matematica - Università di Genova), Funded by GNFM (Gruppo Nazionale Fisica Matematica).
Role: Partecipant