

## ALLEGATO B

UNIVERSITÀ DEGLI STUDI DI MILANO

selezione pubblica per n. 1 posto/i di Ricercatore a tempo determinato in tenure track (RTT)  
per il settore concorsuale: 01/A3 - Analisi Matematica, Probabilità e Statistica Matematica ,  
settore scientifico-disciplinare: MAT/06 - Probabilità e Statistica Matematica  
presso il Dipartimento di MATEMATICA "FEDERIGO ENRIQUES",  
(avviso bando pubblicato sulla G.U. n. \_\_\_\_\_ del \_\_\_\_\_) Codice concorso: 5540

## Francesco Carlo De Vecchi CURRICULUM VITAE

### INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)

COGNOME	DE VECCHI
NOME	FRANCESCO CARLO
DATA DI NASCITA	11/11/88

### TITOLI

#### TITOLO DI STUDIO

*Laurea in Matematica, 24/02/2011, Univeristà degli Studi di Milano. Milano, Italy*

*Grade: 110/110 con Lode.*

*Thesis: "Aspetti geometrici e applicazioni della teoria dei sistemi integrabili",*

*Advisor: Prof. Livio Pizzocchero*

*Laurea Magistrale in Matematica, 24/07/2014, Univeristà degli Studi di Milano. Milano, Italy*

*Grade: 110/110 con Lode.*

*Thesis: "Symmetries of diffusion processes and applications",*

*Advisor: Prof. Giuseppe Gaeta, Coadvisor: Prof. Stefania Ugolini.*

#### TITOLO DI DOTTORE DI RICERCA O EQUIVALENTI, OVVERO, PER I SETTORI INTERESSATI, DEL DIPLOMA DI SPECIALIZZAZIONE MEDICA O EQUIVALENTE, CONSEGUITO IN ITALIA O ALL'ESTERO

*Dottorato di ricerca in Science Matematiche, 26/03/2018, Univeristà degli Studi di Milano. Milano, Italy*

*Thesis: "Lie symmetry analysis and geometrical methods for finite and infinite dimensional stochastic differential equations",*

*Advisor: Prof. Stefania Ugolini, Coadvisor: Prof. Paola Morando.*

#### CONTRATTI DI RICERCA, ASSEGNI DI RICERCA O EQUIVALENTI

**02/05/2018-31/08/2022 Postdoc** presso Institut für Angewandte Mathematik, Universität Bonn. Bonn (Germany), Supervisore: Prof. Massimiliano Gubinelli.

#### TITOLI DI CUI ALL'ARTICOLO 24 COMMA 3 LETTERA A) E B) DELLA LEGGE 30 DICEMBRE 2010, N. 240

**01/09/2022- in corso (scadenza contratto 31/08/2025), Ricercatore a tempo determinato di tipo B** presso il Dipartimento di Matematica "F. Casorati", Università degli Studi di Pavia, Pavia (Italy).

## ATTIVITÀ DIDATTICA A LIVELLO UNIVERSITARIO IN ITALIA O ALL'ESTERO

1. 04.20–07.20; Teaching assistant for the course “Advanced Topics in Applied Probability - Functional Integration and Quantum Mechanics”, M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn, main lecturer: Prof. Massimiliano Gubinelli.
2. 04.20–07.20; “Graduate Seminar on Stochastic Analysis- The mathematics of Feynman path integrals” for M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
3. 10.20–01.21; “Selected Topics in Stochastic Analysis- Gaussian Measures in Infinite Dimension” for M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
4. 10.20–01.21; Teaching assistant for the course “Markov processes”, M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn, main lecturer: Prof. Andreas Eberle.
5. 04.21–07.21; “Selected Topics in Probability Theory - Gaussian Measures II: Applications to (S)PDEs” for M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
6. 10.21–02.22; “Grundzüge der Stochastischen Analysis/Foundations in Stochastic Analysis” for B.Sc. And M.Sc. in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
7. 10.22–01.23; “Elementi di statistica matematica” (in collaboration with Prof. Emanuele Dolera) for Laure in Matematica, Università degli studi di Pavia.
8. 03.23–06.23; “Complementi di analisi matematica e statistica” (in collaboration with Prof. Stefano Lisini and Prof. Antonio Segatti) for Laurea in Ingegneria Industriale, Università degli studi di Pavia.
9. 10.23–01.24; “Elementi di statistica matematica” (in collaboration with Prof. Emanuele Dolera) for Laurea in Matematica, Università degli studi di Pavia.

## ATTRIBUZIONE DI INCARICHI DI INSEGNAMENTO, NELL'AMBITO DI DOTTORATI DI RICERCA ACCREDITATI DAL MINISTERO;

1. Marzo 2022: “Gaussian measures and applications to analysis and mathematical physics” per il Dottorato di ricerca in Scienze Matematiche presso l'Università degli Studi di Milano, a.a. 2021-2022 (si veda <https://sites.unimi.it/dottoratomat/proposta-22-2/> e <https://www.unimi.it/it/corsi/corsi-post-laurea/corsi-di-dottorato-phd/catalogo-degli-insegnamenti-la-formazione-dottorale/aa-2021/2022-gaussian-measures-and-applications-analysis-and-mathematical-physics>, Prof. Marco Furman docente del collegio dei docenti responsabile).

## ORGANIZZAZIONE, DIREZIONE E COORDINAMENTO DI GRUPPI DI RICERCA NAZIONALI E INTERNAZIONALI, O PARTECIPAZIONE AGLI STESSI

1. 01.16–12.16: Partecipante al progetto INdAM-GNFM “Progetto Giovani, Symmetries and reduction for differential equations: from the deterministic to the stochastic case.” P.I.: Prof. Paola Morando. Finanziato dall'Istituto Nazionale di Alta Matematica.
2. 05.18–08.19: Membro del “Collaborative Research Centre 1060 (SFB 1060): The Mathematics of Emergent Effects, project B09”. Finanziato dalla German Research Foundation (DFG).
3. 01.19–08.22: Partecipante alla “Research Area B1 (Probabilistic modeling and singular stochastic dynamics)” del “Cluster of Excellence: Hausdorff Center for Mathematics, Bonn, Germany.” (si veda <https://www.hcm.uni-bonn.de/research/research-areas/ra-b1/>).
4. 04.20–12.21: Partecipante al progetto INdAM-GNAMPA “Lie symmetry analysis of Stochastic Optimal Control Problems with applications”. P.I.: Prof. Stefania Ugolini.

## ORGANIZZAZIONE EVENTI SCIENTIFICI

1. Local organizer del workshop Geometry and algebra in stochastic Dynamics presso il Dipartimento di Matematica, Università degli studi di Milano, 27-29 January, Milano (altri organizzatori: Sergio Albeverio, Frederic Patras, Stefania Ugolini, Elisa Mastrogiacomo, Paola Morando, si veda

<http://users.mat.unimi.it/users/ugolini/workshop2020/>)

2. Organizzatore di Oberseminar Stochastics presso Institute for Applied Mathematics, University of Bonn, Winter Semester 2019/20, Sommer Semester 2020, Winter Semester 2020/21, Sommer Semester 2021 (altri organizzatori: Patrik Ferrari, Ronan Herry) (si veda <https://wt.iam.uni-bonn.de/eventcalendar/events>).

## ATTIVITÀ DI RELATORE A CONGRESSI E CONVEGNI NAZIONALI E INTERNAZIONALI

### *Contributi su invito:*

1. Title of the talk: Symmetries of stochastic differential equations, workshop “Stochastic and Symmetry: theory and applications from Mechanics to Finance”, October 5th 2015, Milano (Italy)
2. Title of the talk: Symmetries of stochastic differential equations: theory and applications, “Assemblea scientifica GNFM 2017”, May 4th-6th 2017, Montecatini Terme (Italy)
3. Title of the talk: Gauge symmetries of semimartingales, “Symmetry and invariance in stochastic dynamics”, September 18th 2017, San Giorgio di Valpolicella (Italy)
4. Title of the talk: Gauge symmetries of semimartingales, “Stochastic systems: their analysis, geometry and perturbation”, July 10th-15th 2018, Beijing (China)
5. Title of the talk: Elliptic stochastic quantization and supersymmetry, “Random transformation and invariance in stochastic dynamics”, March 25th-28th 2019, Verona (Italy)
6. Title of the talk: Elliptic stochastic quantization and supersymmetry, April 25th 2019, University of Wuppertal, Wuppertal (Germany)
7. Title of the talk: Elliptic stochastic quantization and supersymmetry, June 12th 2019, University of Warwick, Coventry (United Kingdom)
8. Title of the talk: Elliptic stochastic quantization, during the trimester program “Randomness, PDEs and Nonlinear Fluctuations”, September 19th 2019, Hausdorff Research Institute for Mathematics, Bonn (Germany)
9. Title of the talk: Stochastic quantization of exponential quantum field theory, “Harmonic Analysis and Rough Paths”, November 18th-19th 2019, Bonn (Germany)
10. Title of the talk: Grassmannian stochastic analysis and the stochastic quantization of Euclidean Fermions, DMV Jahrestagung 2020: Minisymposium: Nonlinear PDEs & Probability, September 14th-17th 2020, Germany
11. Title of the talk: Stochastic quantization of exponential quantum field theory, Webinar: Recent developments in Stochastics with Applications in Mathematical Physics and Finance, November 23rd- 24th 2020
12. Title of the talk: An introduction to Grassmannian stochastic analysis, New Directions in Rough Path Theory, December 7th-12th 2020, Mathematisches Forschungsinstitut Oberwolfach, Germany
13. Title of the talk: Stochastic quantization of exponential-type quantum field theories, Minisymposium “Stochastic Evolution Equations (MS - ID 68)” at 8th European Congress of Mathematics, June 20th - 26th 2021, Portorož (Slovenia)
14. Title of the talk: Stochastic methods in quantum fields: introduction and applications to scalar fields, “13th Colloquium on Mathematics and Foundations of Quantum Theory”, July 2nd 2021, Adam Mickiewicz University in Poznań, Poznań (Poland)
15. Title of the talk: Stochastic quantization of exponential-type quantum field theories, “The 7th KTGU Mathematics Workshop for Young Researchers”, February 14th 2022, University of Kyoto (Japan)
16. Title of the talk: Bose-Einstein condensation and McKean-Vlasov optimal control problems, Session: “Stochastic methods in quantum theory” at “Third Italian Meeting on Probability and Mathematical Statistics”, June 13th-16th, 2022, Bologna (Italy)
17. Title of the talk: Stochastic quantization of exponential-type quantum field theories, Session: “Rough analysis and applications” at “Third Italian Meeting on Probability and Mathematical Statistics”, June 13th-16th, 2022, Bologna (Italy)
18. Title of the talk: Grassmannian Stochastic Analysis and the Stochastic Quantization of Euclidean Fermions, Invited session: “Quantum field theory and stochastic analysis” at “IMS Annual Meeting in Probability and Statistics”, June 27th-30th 2022, London (U.K.)

19. Title of the talk: A differential characterization of exponential quantum field theory on the plane, "Pavia-Milano Seminar series on Probability and Mathematical Statistics", October 17th 2022, Pavia (Italy)
20. Title of the talk: An introduction to stochastic quantization of Euclidean fermions, "Mathematical Quantum Matter", January 9th-11th 2023, Milan (Italy)
21. Title of the talk: Non-commutative  $L_p$  spaces and Grassmann stochastic analysis, "Stochastic Analysis meets QFT - critical theory", June 12th-14th 2023, Münster (Germany)
22. Title of the talk: Non-commutative probability and the quantization of Euclidean fermionic fields, "Rough paths, Quantum field theory, and Renormalization", October 2nd-3rd 2023, Gjøvik (Norway)
23. Title of the talk: A stochastic analysis approach to the quantization of subcritical fermionic fields, October 6th 2023, University of Helsinki, Helsinki (Finland)
24. Title of the talk: A stochastic analysis approach to the quantization of subcritical fermionic fields, "Common trends and challenges in QFT and stochastic PDEs", January 11th-12th 2024, Pavia (Italy)
25. Title of the talk: A stochastic analysis approach to the quantization of fermionic fields, Freie Universität Berlin, February 09th 2024, Berlin (Germany)
26. Title of the talk: Integration by parts formula and quantum field theory, "Trento Probability Seminars, a.a. 2023-24", February 14th 2024, Trento (Italy)

#### ***Altri contributi a convegni:***

1. Title of the talk: Entropy Chaos and Bose-Einstein Condensation, conference "Mathematical Challenges in Quantum Mechanics", February 8th-13th 2016, Bressanone (Italy)
2. Title of the talk: Symmetries of SDEs and applications, conference "Stochastic Partial Differential Equations and Applications", May 30th- June 3rd 2016 Levico Terme (Italy)
3. Title of the poster: Invariance properties of SDEs with application to stochastic calculus, June 19th-22<sup>nd</sup> 2017, Torino (Italy)
4. Title of the poster: Gauge symmetries of semimartingales with applications, "Opening conference of Verona Paris Stochastic Modelling Semester", December 2017 18th-21st, Verona (Italy)
5. Title of the talk: Elliptic stochastic quantization, "Second Italian Meeting on Probability and Mathematical Statistics", June 17th - 20th 2019, Vietri sul Mare (Italy)
6. Title of the talks: Symmetries of SDEs driven by semimartingales with jumps I and II, Supersymmetry and dimensional reduction of SDEs and SPDEs, "Geometry and Algebra in Stochastic Dynamics", January 27th-30th 2020, Milano (Italy)
7. Title of the prerecorded talk: Grassmannian stochastic analysis and the stochastic quantization of Euclidean Fermions, Bernoulli-IMS One World Symposium 2020, August 24th-28th 2020
8. Title of the talk: Stochastic quantization of exponential-type quantum field theories, "Analytical Methods in Quantum and Continuum Mechanics: Winter School In Turin", November 29th-December 3rd, 2021, Torino (Italy)
9. Title of the talk: Stochastic quantization of exponential-type quantum field theories, "SPDEvent", September 7th- 9th, 2022, Bielefeld (Germany)

## **PRODUZIONE SCIENTIFICA**

### **PUBBLICAZIONI SCIENTIFICHE**

*(per ciascuna pubblicazione indicare: nomi degli autori, titolo completo, casa editrice, data e luogo di pubblicazione, codice ISBN, ISSN, DOI o altro equivalente)*

#### ***Articoli su rivista***

1. Albeverio Sergio, Luigi Borasi, Francesco C. De Vecchi and Massimiliano Gubinelli. "Grassmannian stochastic analysis and the stochastic quantization of Euclidean Fermions." *Probability Theory and Related Fields* (2022): 1-87.

2. Albeverio, Sergio, Francesco C. De Vecchi, Andrea Romano and Stefania Ugolini. "Mean-field limit for a class of stochastic ergodic control problems." *SIAM Journal on Control and Optimization* Vol. 60, Iss. 1 (2022): 479-504
3. De Vecchi, Francesco C., Mastrogiovanni, Elisa, Turra, Mattia, and Ugolini, Stefania. "Noether theorem in stochastic optimal control problems via contact symmetries." *Mathematics (MDPI)* 9.9 (2021): 953.
4. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "Reduction and reconstruction of SDEs via Girsanov and quasi Doob symmetries." *Journal of Physics A: Mathematical and Theoretical* 54 (2021): 185203.
5. Albeverio, Sergio, De Vecchi, Francesco C., Morando, Paola, and Ugolini, Stefania (2021). "Random transformations and invariance of semimartingales on Lie groups." *Random Operators and Stochastic Equations* 29.1 (2021): 41-65.
6. Albeverio, Sergio, Francesco C. De Vecchi, and Massimiliano Gubinelli. "The elliptic stochastic quantization of some two dimensional Euclidean QFTs". *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques*. Vol. 57. No. 4. (2021): 2372-2414.
7. De Vecchi, Francesco C., Luca M. Giordano, Daniela Morale and Stefania Ugolini "A note on the continuity in the Hurst index of the solution of rough differential equations driven by a fractional Brownian motion." *Stochastic Analysis and Applications* (2020): 1-15.
8. De Vecchi, Francesco C., and Paola Morando. "The geometry of differential constraints for a class of evolution PDEs." *Journal of Geometry and Physics* (2020): 103771.
9. Albeverio, Sergio, Francesco C. De Vecchi, and Massimiliano Gubinelli. "Elliptic stochastic quantization." *Annals of Probability* 48.4 (2020): 1693-1741.
10. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "Symmetries of stochastic differential equations using Girsanov transformations." *Journal of Physics A: Mathematical and Theoretical* 53.13 (2020): 135204.
11. Albeverio, Sergio, Francesco C. De Vecchi, Paola Morando and Stefania Ugolini "Weak symmetries of stochastic differential equations driven by semimartingales with jumps." *Electronic Journal of Probability* 25 (2020).
12. Albeverio, Sergio, Francesco C. De Vecchi, Andrea Romano and Stefania Ugolini "Strong Kac's chaos in the mean-field Bose-Einstein Condensation." *Stochastics and Dynamics* (2019): 2050031
13. De Vecchi, Francesco C., Andrea Romano and Stefania Ugolini. "A symmetry-adapted numerical scheme for SDEs." *Journal of Geometric Mechanics* 11.3 (2019).
14. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "A note on symmetries of diffusions within a martingale problem approach." *Stochastics and Dynamics* (2018): 1950011
15. De Vecchi, Francesco C., and Paola Morando. "Solvable structures for evolution PDEs admitting differential constraints." *Journal of Geometry and Physics* 124 (2018): 170-179.
16. Albeverio, Sergio, Francesco C. De Vecchi, and Stefania Ugolini. "Entropy Chaos and Bose-Einstein Condensation." *Journal of Statistical Physics* 168.3 (2017): 483-507.
17. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "Reduction and reconstruction of stochastic differential equations via symmetries." *Journal of Mathematical Physics* 57.12 (2016): 123508.
18. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "Symmetries of stochastic differential equations: A geometric approach." *Journal of Mathematical Physics* 57.6 (2016): 063504.
19. De Vecchi, Francesco C., and Stefania Ugolini. "An entropy approach to Bose-Einstein condensation." *Comm. on Stoch. Anal* 8.4 (2014): 517-529.

***Proceedings per convegni internazionali***

1. Albeverio, Sergio, Francesco Carlo De Vecchi, and Stefania Ugolini. "Some Connections Between Stochastic Mechanics, Optimal Control, and Nonlinear Schrödinger Equations." *Mathematics Going Forward: Collected Mathematical Brushstrokes*. Cham: Springer International Publishing, 2022. 505-534.
2. Albeverio, Sergio, and Francesco C. De Vecchi. "Some Recent Developments on Lie Symmetry Analysis of Stochastic Differential Equations." *International Conference on Random Transformations and Invariance in Stochastic Dynamics*. Springer, Cham, 2019.
3. De Vecchi, Francesco C. and Massimiliano Gubinelli. "A note on supersymmetry and stochastic differential equations." *International Conference on Random Transformations and Invariance in Stochastic Dynamics*. Springer, Cham, 2019.

### **Preprints**

1. Barashkov, Nikolay, Francesco C. De Vecchi, and Immanuel Zschimmer. "Invariant Gibbs measure for Anderson NLW." *arXiv preprint arXiv:2309.01635* (2023).
2. De Vecchi, Francesco C., Paola Morando, and Stefania Ugolini. "Integration by parts formulas and Lie's symmetries of SDEs." *arXiv preprint arXiv:2307.05089* (2023).
3. De Vecchi, Francesco C., Luca Fresta, Maria Gordina and Massimiliano Gubinelli. "Non-commutative  $L^p$  spaces and Grassmann stochastic analysis." *arXiv preprint arXiv:2305.08497* (2023).
4. De Vecchi, Francesco C., Massimiliano Gubinelli, and Mattia Turra. "A singular integration by parts formula for the exponential Euclidean QFT on the plane." *arXiv preprint arXiv:2212.05584* (2022).
5. De Vecchi, Francesco C., Luca Fresta, and Massimiliano Gubinelli. "A stochastic analysis of subcritical Euclidean fermionic field theories." *arXiv preprint arXiv:2210.15047* (2022).
6. Barashkov Nikolay and Francesco C. De Vecchi "Elliptic stochastic quantization of Sinh-Gordon QFT." *arXiv preprint arXiv:2108.12664* (2021).

Data

30/05/24

Luogo

Pavia