

CURRICULUM VITAE

ROBERTO GIUNTINI

May 2025

PERSONAL DETAILS

Address Dipartimento di Pedagogia, Psicologia, Filosofia
 Università di Cagliari
 Via Is Mirrionis 1
 I-09123 Cagliari
 Italy
 Institute for Advanced Study
 Technische Universität München
 Lichtenbergstraße 2
 D-85748 Garching bei München
 Germany

E-mail: giuntini@unica.it

Orcid: 0000-0003-2078-0297

CURRENT POSITION

2001– **Full Professor** of Logic and Philosophy of Science, University of Cagliari, Cagliari.

AREAS OF INTEREST

Non-classical Logics; Quantum Logic; Philosophical Foundations of Quantum Mechanics; Fuzzy and Multi-Valued Logics; Quantum Computation and Information; Quantum Machine Learning; Quantum Artificial Intelligence; Applications of Quantum Formalism to Music.

EDUCATION

1987–1991 **PhD**, Department of Philosophy, University of Florence
 Dissertation: *Hidden Variables and Quantum Logic*
 Supervisors: Prof. Dr. Maria Luisa Dalla Chiara (University of Florence) and
 Prof. Dr. Peter Mittelstaedt (University of Cologne).

1979–1984 **Laurea**, Department of Philosophy, University of Florence.

ACADEMIC POSITIONS

- 2001– **Full Professor** of Logic and Philosophy of Science, University of Cagliari, Cagliari.
- 2023–2025 **Philosopher in Residence** at the Institute for Advanced Study of the Technische Universität München
- 2018–2021 **Member** of the Centro Linceo Interdisciplinare “Beniamino Segre”, Accademia dei Lincei, Rome.
- 1998–2001 **Associate Professor** of Logic and Philosophy of Science, University of Cagliari, Cagliari.
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HONORS AND AWARDS

- 2024– **Ordinary Member** of the European Academy of Sciences and Arts.
- 2023–2024 **Philosopher in Residence** at the Institute for Advanced Study of the Technische Universität München.
- 2023– **Corresponding Member** of the Académie Internationale de Philosophie de Sciences.
- 2020 **Jur Hronec Medal of the Slovak Academy of Sciences.**
- 1998 **Birkhoff-von Neumann Prize**, International Quantum Structures Association (IQSA).
- 1987 **Alexander von-Humboldt Fellowship**, Institute for Theoretical Physics, University of Cologne (with Prof. Dr. Peter Mittelstaedt).
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ACADEMIC AND SCIENTIFIC SERVICE

- 2019 – **Associate editor** of *Studia Logica*.
- 2018 – **Associate editor** of *Mathematica Slovaca*.
- 2018 – **Member** of the Editorial Board of *Logica Universalis*.
- 2013 – **Member** of the Editorial Board of the Series *Trends in Logic*, Springer.
- 2018–2020 **Member** of *Gruppo di lavoro TECO-D/Filosofia* of the Italian Quality Research Assessment, ANVUR (Italian National Agency for the Evaluation of the University and Research Systems).
- 2014–2020 **Member** of the Steering Committee and of the Nominating Committee of the *International Quantum Structures Association* (IQSA).
- 2017–2020 **President** of the *Italian Society for Logic and the Philosophy of Science* (SILFS).
- 2015–2017 **Member** of the Panel of Evaluation Experts (GEV) of the Italian National Agency for the Evaluation of the University and Research Systems (ANVUR).
- 2010–2012 **President** of the *International Quantum Structures Association* (IQSA).
- 2008–2014 **Member** of the Steering Committee of the *Società Italiana di Logica e Filosofia delle Scienze* (SILFS).
- 2013 **Lead Scorer** for the “Test for the generic skills of undergraduate students” (TeCo), ANVUR (Italian National Agency for the Evaluation of the University and Research Systems).

2011–2012	Director of the PhD Programme “Philosophy and Epistemology”, University of Cagliari.
2005–2010	Director of the PhD Programme “History, Philosophy and Didactics of Science”, University of Cagliari.
2005–2006	Delegate of the Rector of the University of Cagliari for <i>E-learning</i> .
2005–2006	Member of the Board of Directors of UNITEL (Consorzio Interuniversitario per l’Università Telematica della Sardegna).

RESEARCH AND TEACHING VISITS

2025/02-04; 09	Philosopher in Residence , Institute for Advanced Study, Technical University Munich.
2023-2024	Philosopher in Residence , Institute for Advanced Study, Technical University Munich.
2020/03-06	Visiting Scientist , Netherlands Organisation for Scientific Research, Institute of Logic, Language and Computation, University of Amsterdam, Amsterdam.
2019/06-07	Alexander von Humboldt Stiftung Visiting Fellow , Munich Center for Mathematical Philosophy, Munich.
2019/04-05	Alexander von Humboldt Stiftung Visiting Fellow , Technische Universität, Berlin.
2019/09	Visiting Scientist , Research Institute of the University of Bucharest, Bucharest (declined <i>pour cas de force majeure</i>).
2016/04	Visiting Scientist , Institute of Logic and Cognition, Sun Yat-Sen University, Guangzhou.
2013/12	Visiting Scientist , Indian Institute of Technology, Jodhpur.
2012/03-05	Alexander von Humboldt Stiftung Visiting Fellow , Institute of Philosophy II, Ruhr University Bochum.
2012/02	Visiting Scientist , Institute of Logic, Language and Computation, University of Amsterdam, Amsterdam.
1987/04-12	Alexander von Humboldt Stiftung Fellow , Institute of Theoretical Physics, University of Cologne, Cologne.

RESEARCH FUNDING

2022-2026	MSCA Staff Exchanges 2021,; Project: <i>Philosophical, Logical, and Experimental routes to substructurality</i> , Role: Participant . (€90,000). (€625,600).
2022-2025	“Ubiquitous Quantum Reality (UQR): understanding the natural processes under the light of quantum-like structures”, funded by Fondazione di Sardegna (code: F73C22001360007).
2022-2025	“CORTEX The Cost of Reasoning: Theory and Experiments”, funded by the Ministry of University and Research (Prin 2022, cod. 2022ZLLR3T). Role: Participant . (€56,000).

2022-2025	“Quantum Models for Logic, Computation and Natural Processes (Qm4Np)” funded by the Ministry of University and Research (Prin-Pnrr 2022 cod. P2022A52CR). Role: Partecipant .
2019-2020	Autonomous Region of Sardinia (RAS); Project: <i>A Semantical Extension of Quantum Computational Logic: Theory and Applications</i> , RASSR40341. Role: Principal Investigator .
2017	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>Syntax and Semantics of Fuzzy and Quantum Logic</i> . Visiting Professor: Prof. Petr Cintula. Role: Hosting Professor . (€ 5, 626).
2015-2018	Marie Skłodowska-Curie Research and Innovation Staff Exchange (RISE), Horizon 2020, project number 689176; Project: <i>Syntax Meets Semantics: Methods, Interactions, and Connections in Substructural Logics</i> . Role: Partecipant .
2013-2016	Progetti di Rilevante Interesse Nazionale (PRIN 2012), Italian Ministry of University and Research; Project: <i>Models and Inferences: Logical, Epistemological and Cognitive Aspects</i> . Role: Local Coordinator . (€40, 300).
2012-2016	Autonomous Region of Sardinia (RAS); Project: <i>Modelling the Uncertainty: Quantum Theory and Machine Learning</i> , RAS CRP-59872. Role: Principal Investigator (€283, 489).
2013	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>Negation in Constructive Logic</i> . Visiting Professor: Prof. Heinrich Wansing. Role: Hosting Professor . (€2, 885).
2010-2011	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>Algebra and Logic from Quantum Computation</i> . Visiting Professor: Prof. Hector Freytes. Role: Hosting Professor . (€78, 252).
2011	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>The History and Philosophy of the Notion of Fundamental Length in Modern Physics</i> . Visiting Professor: Prof. Amit Hagar. Role: Hosting Professor . (€21, 693).
2009	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>Algebraic and Logical System of Quantum Computing</i> . Visiting Professor: Prof. Tomasz Kowalski. Role: Hosting Professor . (€84, 000).
2007	Visiting Professor Programme of the Autonomous Region of Sardinia (RAS); Project: <i>Algebraic and Logical System of Quantum Computing</i> . Visiting Professor: Prof. Anatolij Dvurečenskij. Role: Hosting Professor . (€14, 000).
1999-2001	Italian Ministry of Research and University; Project: <i>Contextuality, Non-locality and Lorentz Invariance: Physical, Epistemological and Logical aspects</i> . Role: Local coordinator .

INVITED TALKS (LAST FIVE YEARS)

1. “Machine Learning and Quantum Mechanics”, Eberhardts Karls Universität Tübingen, Carl Friedrich von Weizsäcker-Zentrum, Tübingen (11/06/2024).
2. “Machine Learning meets Quantum Mechanics”, Ruhr Universität Bochum, Bochum (13/06/2024).
3. “Supervised Classification and Quantum Mechanics”, Università degli Studi Mediterranea, Reggio Calabria (25/03/2023).

4. “A Quantum approach to Pattern Recognition”, PM65 Congress, Firenze (15/10/2021).
5. “Quantum-Inspired Machine Learning”, *Trends in Quantum Computing and Quantum Logic*, Berlin (15/01/2021).
6. “Apprendimento automatico e Meccanica quantistica”, Lezioni del Centro Linceo B. Segre, Accademia delle Scienze dell’Istituto di Bologna (23/11/2020).
7. “From classical logic to the logic of quantum computation”, XXIII International School in Philosophy of Physics, Cesena-Urbino (15/06/2020).
8. “A quantum-like approach to Machine Learning”, Institute of Logic, Language and Computation, Amsterdam (22/10/2020).
9. “From Classical Logic to the Logic of Quantum Computation”, XXIII International Summer School in Philosophy of Physics. Philosophy of Quantum Computation, Urbino (15/06/2020).
10. “Paraorthomodular Brouwer-Zadeh lattices”, *Quantum Logic & Beyond*, Amsterdam, (29/04/2020).
11. “Un approccio quantistico al Machine Learning”, Lezioni del Centro Linceo B. Segre, University of Cagliari (13/02/2020).
12. “Olismo e composizionalità nella logica quantistica computazionale”, Lezioni del Centro Linceo B. Segre, University of Urbino (22/10/2019).
13. “Logiche quantistiche fuzzy”, Lezioni del Centro Linceo B. Segre, University of Bologna (22/10/2019).
14. “Paraorthomodular Brouwer-Zadeh logics”, *24th Conference Applications of Logic in Philosophy and the Foundations of Mathematics*, Szklarska Poreba (14/05/2019).
15. “The universal interest of quantum information: semantic applications in different fields”, *Alexander von Humboldt Workshop: Trends in Quantum Computing and Quantum Logic*, Berlino, (08/05/2019).
16. “ $\{0, 1\}$ e $[0, 1]$: dalla logica classica alla logica quantistica fuzzy”, Lezioni del Centro Linceo B. Segre, University of Florence (29/03/2019).
17. “Paraorthomodular Brouwer-Zadeh lattices”, Faculty of Mathematics and Computer Science, University of Bucharest (06/12/2018).
18. “Classical and quantum degrees of truth”, *Humboldt Kolleg, Proof Theory as Mathesis Universalis*, Villa Vigoni, Como (24-28/07/2017).
19. “From Turing to Quantum Computers”, Department of Humanities, University of Catania, Catania (22/03/2017).
20. “Sì, No, Forse: un’introduzione logica alla computazione quantistica”, Department of Philosophy and Communication, University of Bologna, Bologna (24/11/2016).
21. “Yes, No, Perhaps: A logical introduction to quantum computation”, Faculty of Mathematics and Computer Science, University of Bucharest (28/11/2016).
22. “From sharp to unsharp quantum logic”, *Quantum Mechanics and Quantum Information: Physical, Philosophical and Logical Approaches*, Buenos Aires (16-18/06/2016).
23. “A new look at the effects of a Hilbert space”, Department of Physics, University of La Plata, La Plata (21/06/2016).

24. “From sharp to unsharp quantum logic”, Institute of Mathematics, Slovak Academy of Science, Bratislava (15/03/2016).
25. “A logical introduction to quantum computation”, Irving K. Barber School of Arts and Sciences, University of British Columbia, Kelowna (02/12/2015).
26. “Brouwer-Zadeh Lattices”, *Amsterdam Quantum Logic Workshop 2015*, Amsterdam (07-08/05/2015).
27. “Quantum Turing Machines, Quantum Computational Logic and Cognitive Processes”, *Quantum Mechanics and Quantum Information. Physical, Philosophical and Logical approaches, Bruxelles* (23-24/06/2015).
28. “Sharp and unsharp universes”, *International Meeting on Quantum Correlation and Logic, Language and Set Theory*, Indian Institute of Technology, Jodhpur (9-14/12/2013).
29. “The logic of quantum computation”, Institute of Theoretical Physics, University of Cologne, Cologne (16/05/2012).
30. “A Gentle introduction to the logic of quantum computation”, Institute of Philosophy II, Ruhr University, Bochum (05/2012).
31. “Quantum (logical) gates and their logic(s)”, Descartes Centre for the History and Philosophy of the Sciences and the Humanities, University of Utrecht, Utrecht (23/02/2012).
32. “The logic of unsharp quantum mechanics”, Institute of Logic, Language and Computation, University of Amsterdam, Amsterdam (22/02/2012).
33. “Crash Course on the logic of quantum computation and information”, Institute of Logic, Language and Computation, University of Amsterdam, Amsterdam (02/2012).
34. “The algebraic structure of an approximately universal system of quantum computational gates”, Institute of Mathematics, Slovak Academy of Science, Bratislava (11/12/2011).
35. “From classical to quantum computation: I and II”, *XIV International Summer School in Philosophy of Physics*, Cesena (16-17/09/2011).
36. “The algebraic structure of an approximately universal set of quantum gates”, *The Philosophy of Computer Science and Artificial Intelligence*, Azores Islands (7-10/09/2011).
37. “An algebraic characterization of quantum computational logics”, *Logics Inspired by Quantum Computation*, Bloomington, Indiana (12/05/2009).
38. “Quantum computational logics”, Facoltà di Scienze della Comunicazione, University of Teramo, Teramo (02/12/2009).
39. “Quantum computational logics”, Department of Humanities, Philosophy and Communication, University of Bergamo, Bergamo (23/03/2009).
40. “Quantum MV-algebras”, *First Sardinian-Catalan Workshop on Algebraic and Fuzzy Logic*, Cagliari (5-6/10/2007).
41. “Holistic quantum computational semantics and Gestalt-thinking processes”, Department of Physics, University of Pavia (07/04/2006).
42. “The logic of quantum computation: results and open problems”, *ESF Scientific Network Conference, Philosophical and Foundational Issues in Quantum Theory* Budapest (01-04/09/2005).

43. "Reversibility and Irreversibility in Quantum Computation", *Natural Processes and Models of Computation*, Bologna, 2005 (16-18/06/2005).
44. "From Von Neumann quantum logic to the logic of quantum computers", Department of Physics, University of Camerino, Camerino (20/04/2005).
45. "Quasi MV-algebras", Institut of Mathematics, Slovak Science Academy, Institute of Mathematics, Slovak Academy of Science, Bratislava (15/03/2005).
46. "Quantum computational logics for entangled and contextual information", *Logical aspects of quantum information*, Porto Conte, Sardinia (23-25/09/2004).
47. "Quantum computational logics and Fock space semantics", *Foundations of quantum computations*, Camerino (16-18/04/2004).
48. "Quantum computational logics as complex-valued logics", European Laboratory for Non-Linear Spectroscopy, Firenze (27/01/2004).
49. "Quantum computational structures", Department of Physics, University of Florence, Firenze (20/10/2003).
50. "Quantum logic and lattice theory", *V International Summer School in Philosophy of Physics*, Cesena (06/2002).
51. "Popper and the logic of quantum mechanics", *Karl Popper 2002 Symposium*, Vienna (03-07/07/2002).
52. "Logica della computazione quantistica", Cesena (22/09/2000).
53. "QMV-algebras and quantum structures", *Biannual Meeting of the International Quantum Structures Association*, Liptovsky Jan, Slovacchia (30/08-05/09/1998).
54. "Axiomatizing QMV-algebras", *Forth Annual Meeting Florence-Stanford*, Firenze (14-16/03/1997).
55. "Łukasiewicz quantum logics", *XVI Incontro di Logica Matematica*, Genova (24-26/10/1996).
56. "Fisica e filosofia: il paradosso di Einstein-Podolsky e Rosen", *Corso di perfezionamento in antropologia e fondamenti delle scienze*, University of Urbino, Urbino (22/06/1996).
57. "Time and histories in quantum theory", *Pittsburgh Center Fellows International Conference*, Castiglioncello, Italy (19-24/05/1996).
58. "Fuzzy quantum logics", *Aspects of mechanizing inference*, Napoli (30/10-02/11/1995).
59. "Logiche quantistiche di Łukasiewicz", *Fondamenti e Filosofia della Fisica*, Cesena (26-29/09/1994).
60. "Generalized MV algebras and unsharp orthoalgebras", Department of History and Philosophy of Science, Cambridge (26/03/1994).
61. "Logiche quantistiche parziali e unsharp", *I Fondamenti della Meccanica Quantistica*, Lecce (05-09/10/1993).
62. "Brouwer-Zadeh logic and the operational approach to quantum mechanics", *Biannual Meeting of the International Quantum Structure Association*, Castiglioncello, Italy (21-26/09/1992).
63. "Semantics for Brouwer-Zadeh logics", *Ordered Structures*, Napoli (14-15/02/1990).

64. “Il problema delle variabili nascoste in meccanica quantistica”, Department of Physics, University of Lecce, Lecce (10-11/11/1989).
65. “Logico-algebraic structures from the unsharp approach to quantum mechanics”, Institute of Theoretical Physics, University of Cologne (05/05/1989).
66. “Weak quantum logics”, *Fondamenti della Meccanica Quantistica*, Camerino (31/10-03/11-1988).
67. “Unsharp properties and quantum logics”, *Autumn School of Logic and Its Applications*, Warsaw (07-15 /10/1988).
68. “Open problems in the logical foundations of quantum theory”, Institute of Theoretical Physics, University of Cologne (21/10/1987).
69. “Possible-world semantics for the logic of quantum mechanics”, Institute of Theoretical Physics, University of Cologne (21/10/1987).

REFEREE AND REVIEWING

Algebra Universalis, Czech Science Foundation (GACR), Flanders Research Foundation (FWO), Foundations of Physics, Fuzzy Sets and Systems, International Journal of Theoretical Physics, Journal of Mathematical Analysis and Applications, Journal of Philosophical Logic, Ministero Italiano dell'Università e della Ricerca, Studia Logica, Studies in History and Philosophy of Modern Physics, Tatra Mountains Journal of Mathematics, University of British Columbia, University of Denver, University of Padua.

BIBLIOMETRIC INDICES

Scopus	Google Scholar
Publication years: 1987-2023	Publication years: 1987-2023
H-index: 16	H-index: 28
Citations: 977	Citations: 2788
Documents: 99	Documents: 189
Co-authors: 54	Co-authors: 54