

Marco Sanchioni

Associate Professor of Philosophy of Science

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Areas of Research and Teaching

Specialization. Philosophy of physics; foundations of physics; philosophy of quantum gravity; black holes; spacetime emergence and complexity; holography; string theory; quantum field theory; quantum mechanics.

Competence. Philosophy of science; epistemology; metaphysics; ethics and philosophy of artificial intelligence; theoretical physics.

Academic Positions

since 2024	Associate Professor of Philosophy of Science , Sophia University Institute.
2022–2023	Adjunct Professor of Philosophy of Science, Sophia University Institute.

Education

2023	PhD in Philosophy of Science , University of Urbino “Carlo Bo”. Advisor: Gino Tarozzi; co-advisor: Vincenzo Fano. Thesis: <i>A Philosopher’s Take on the Black Hole Information Paradox</i> .
2022	Visiting PhD Student, University of Oxford.
2018	PhD in Theoretical Physics , Niels Bohr Institute, University of Copenhagen. Advisor: Niels A. Obers. Thesis: <i>Blackfolds and non-AdS Holography</i> .
2013	Diploma in Theoretical Physics, SISSA — International School for Advanced Studies.
2013	MSc in Physics, University of Trento (110/110 <i>cum laude</i>). Advisor: Lorian Bonora.
2011	BSc in Physics, University of Bologna (110/110 <i>cum laude</i>). Advisor: Roberto Casadio.

Honours and Awards

2023	EPSA Graduate Student Essay Prize — European Philosophy of Science Association, for the most engaging paper published in the <i>European Journal for Philosophy of Science</i> by a graduate student.
2022	Winner, first Blaumann Foundation call for projects in the foundations of physics.
2021	Giulio Giorello Prize for the Philosophy of Science , for <i>On Entanglement as a Relation</i> (with E. Cinti and A. Corti).
2012	SISSA–UniTN Scholarship for excellent scholars in theoretical physics.
2010	Occhialini Scholarship for outstanding high-school graduates in physics.

Publications

Books and edited volumes

2026	<i>Pensare il reale. Prospettive di filosofia della natura. Festschrift in onore di Sergio Rondinara</i> (editor). Città Nuova, 536 pp. ISBN 978-88-311-7080-2.
2024	<i>Un'Euristica del Paradosso. Una luce nei misteri della gravità quantistica</i> . Città Nuova.
2022	<i>I Paradossi dei Buchi Neri. Una spiegazione elementare per comprendere l'universo</i> . Carocci Editore (with E. Cinti).

Peer-reviewed articles

2026	The Problem of Generalized Measurements in Relational Quantum Mechanics. <i>International Journal of Theoretical Physics</i> 65(6), art. 183 (with V. Fano and S. Salzano).
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- 2026 Relational Unsharp Properties: A POVM-Based Ontology for Relational Quantum Mechanics. *European Journal for Philosophy of Science* 16(1), art. 13 (with V. Fano and S. Salzano).
- 2026 Relational Information: Towards a New Kind of Information in Quantum Mechanics. *Foundations of Physics* 56(1), art. 14 (with N. Covoni).
- 2026 Relational Quantum Mechanics and (Soft) Perspectivism. *Foundations of Physics* 56(1), art. 6 (with N. Covoni and V. Fano).
- 2026 Quando un'analogia guida la scienza. Il ruolo metodologico dell'analogia nella termodinamica dei buchi neri. *Sophia* XVIII(1), 53–68 (with V. Fano). [In Italian.]
- 2026 Transdisciplinarietà e $\mu\epsilon\tau\alpha\acute{\xi}\nu$: la conoscenza nello spazio relazionale tra i saperi. *Sophia* XVIII(1), 11–28 (with M. Martino). [In Italian.]
- 2025 Non-Relativistic Background Independence and the Gauging of Spacetime Symmetries. *The British Journal for the Philosophy of Science* (with N. Bamonti and E. Cinti).
- 2025 Quo Vadis Wheeler–DeWitt Time? Challenging Emergent Time in Quantum Cosmology. *Philosophy of Science* 92(5), 1327–1337 (with N. Bamonti and E. Cinti).
- 2025 A Note on the Electron's Magnetic Moment. *Foundations of Physics* 55(4).
- 2025 Reichenbach's Forgotten Argument. *Foundations of Physics* 55(4) (with E. Cinti, A. Corti and V. Fano).
- 2025 Relational Properties and Relational Quantum Mechanics. *Foundations of Physics* 55(4) (with V. Fano).
- 2025 Peeking Inside the Black Hole: Philosophical Considerations on the AMPSS Paradox and its Resolution. *Foundations of Physics* 55(3) (with E. Cinti).
- 2025 Bridging Supersymmetry and the Spin–Statistics Theorem: A Quest for Emergence. *Synthese* 205(3) (with E. Cinti).
- 2025 A Bayesian Analysis of the Hubble Tension. *Foundations of Science* 30(4), 925–944 (with V. Fano).
- 2025 Il ruolo della transdisciplinarietà nell'era dell'intelligenza artificiale (generativa). *Sophia* XVII(1), 69–94. [In Italian.]
- 2024 Underdetermination in Classic and Modern Tests of General Relativity. *European Journal for Philosophy of Science* 14(4) (with W. J. Wolf and J. Read).
- 2024 Exploring the Interplay Between Wave Function Realism and Gauge Symmetry Interpretations in Quantum Mechanics. *Foundations of Physics* 54(4).
- 2024 Beyond the Quantum Membrane Paradigm: A Philosophical Analysis of the Structure of Black Holes in Full Quantum Gravity. *Foundations of Physics* 54(3) (with E. Cinti).
- 2024 SUSY, Spin-Statistics, and All That: On the Contrast Between Spin-Statistics and Wigner's Theorem. *The British Journal for the Philosophy of Science* (with E. Cinti).
- 2023 Unveiling Paradoxes: Driving Progress in Physics. *Sophia*.
- 2022 On Entanglement as a Relation. *European Journal for Philosophy of Science* 12(1) (with E. Cinti and A. Corti). — *EPSA Graduate Student Essay Prize; Giorello Prize*.
- 2021 Humeanism in Light of Quantum Gravity. *Synthese* 199(3–4), 10839–10863 (with E. Cinti).
- 2021 How Many Properties of Spin Does a Particle Have? *Studies in History and Philosophy of Science* (with A. Corti).
- 2021 The Devil in the (Implicit) Details: On the AMPS Paradox and its Resolution. *International Journal of Theoretical Physics* (with E. Cinti).
- 2021 Phenomenological Strings and String Phenomenology. *Epistemologia*, Festschrift for Vincenzo Fano (with E. Cinti).
- 2016 Lifshitz Hydrodynamics from Lifshitz Black Branes with Linear Momentum. *Journal of High Energy Physics* 10(2016)120 (with J. Hartong and N. A. Obers).
- 2016 Gravitational Tension, Spacetime Pressure and Black Hole Volume. *Journal of High Energy Physics* 09(2016)124 (with J. Armas and N. A. Obers).

Book chapters and proceedings

- 2026 Responsibility in AI-Mediated Environments: An Integral Human Development Perspective. In *Integral Development of Humanity: Concepts and Perspectives*, Studium.
- 2026 Relationality without Agents: Quantum Correlations and the Limits of QBism. In *Proceedings of the Bohr Conference 2025* (with N. Covoni).
- 2025 Leggi di natura e fisica contemporanea. In M. Bernardoni, S. Rondinara (eds.), *Le Leggi*, Città

Nuova (SEFIR).

- 2025 Un'ontologia della relazione? Il caso della meccanica quantistica. In M. Bernardoni, S. Rondinara (eds.), *La Relazione*, Città Nuova (SEFIR).
- 2024 Time, Spacetime and F-Theory. In S. De Bianchi, M. Forgione, L. Marongiu (eds.), *Time and Timelessness in Fundamental Physics and Cosmology*, Springer (Fundamental Theories of Physics), pp. 199–220 (with E. Cinti).
- 2024 On Empirical Incoherence in Quantum Gravity and Spacetime Emergence. In M. Bernardoni, S. Rondinara (eds.), *Il Controllo*, Città Nuova (SEFIR).

Scientific dissemination

- 2026 Abitare l'intelligenza artificiale senza smarrire l'umano. *Città Nuova* (forthcoming).
- 2026 Sul senso dell'umano. Educazione, vocazione e intelligenza artificiale. Dossier *Città Nuova* (forthcoming).
- 2026 Quanto il tutto non è una somma: una lezione dalla complessità. *Nuova Umanità* (forthcoming).
- 2026 *Magnifica Humanitas*: la macchina prova dolore? *Città Nuova*.
- 2026 *Magnifica Humanitas*: ciò che la macchina non sa fare. *Città Nuova*.
- 2026 La *Magnifica Humanitas* di papa Leone: la tecnologia ci interroga su chi siamo. *Città Nuova*.
- 2026 Edgar Morin: tessere ciò che è separato. *Città Nuova*.
- 2025 Le sfide dell'intelligenza artificiale. *Nuova Umanità* (with C. Belzung).
- 2025 Cibernetica, tra passato e presente. *Nuova Umanità*.
- 2025 Binomio tecnica-saggezza nell'era dell'intelligenza artificiale: verso un nuovo umanesimo. *Togetherness*.
- 2024 Sul destino dell'universo. *Futuro*, Dossier di Città Nuova.
- 2023 Infinito fisico. *Nuova Secondaria* (with E. Cinti).
- 2022 Le leggi semplici. *I Martedì* (with V. Fano).
- 2021 Vedere l'invisibile: come Penrose dimostrò matematicamente la natura fisica dei buchi neri. *Nuova Lettera Matematica* (with E. Cinti).

Invited and Contributed Talks

- 2026 The Meaning of Information in the Black Hole Information Paradox. *Perspectives on the Foundations of Information Theory and Statistical Mechanics*, Institute of Philosophy, Università della Svizzera italiana, Lugano (9 May 2026).
- 2025 Matter and Spacetime Divide Between Supersymmetry and Supergravity. *Spacetime Matters*, University of Utrecht.
- 2025 On the Analogy between Higgs and Superconductivity. PRIN 2022 Midterm Workshop, Urbino.
- 2024 Conceptual Insights into Black Hole Paradoxes. 4th International FLAG Workshop, University of Catania.
- 2024 Intelligenza artificiale e cercatori di Dio. Conferenza Episcopale Umbra, Città di Castello. [*In Italian.*]
- 2023 Reichenbach's Forgotten Argument. *Reading the Book of Nature* (400th Anniversary of Galileo's *Il Saggiatore*), Florence.
- 2023 On Entanglement as a Relation. EPSA23, University of Belgrade (*invited talk*).
- 2022 On Entanglement as a Relation. 5th SILFS Postgraduate Conference, University of Milano-Bicocca.
- 2022 Simultaneity in Non-Relativistic Quantum Gravity. IAPT 7, Barcelona; and ILMPS 2022, Milan.
- 2022 No Membrane at the Black Hole Horizon? DPG Spring Meeting, University of Heidelberg.
- 2022 Theoretical Advantages of Supersymmetry; and Supersymmetry in a Nutshell. University of Urbino.
- 2021 Complementarity Lost and Regained. University of Urbino.
- 2020 How Many Properties of Spin Does a Particle Have? *Synergia*, University of Urbino.
- 2019 Understanding Non-Commutative Geometry. *Synergia*, University of Urbino.

Conference participation

- 2025 Launch Conference, Centre for Philosophy of Artificial Intelligence (CPAI), Copenhagen.

2024 Halki Summit VI, Ecumenical Patriarchate.

Teaching

2025 Filosofia del Linguaggio. MA course, Sophia University Institute.
2025 Laboratorio Interdisciplinare di Fede e Scienza. MA course, Sophia University Institute.
2024 Cosmologia e Filosofia della Natura. MA course, Sophia University Institute.
2023 Genesis and Figures of Modern Scientific Rationality. MA course, Sophia University Institute.
2021 Philosophy of Dualities. 12-hour seminar series, University of Bologna.
2020 Philosophy of Black Holes. 12-hour seminar series, University of Bologna.
2015–2016 General Relativity (30 h, twice) and Supersymmetric Field Theory (30 h). MSc in Theoretical Physics, Niels Bohr Institute, University of Copenhagen.

Doctoral Supervision

since 2024 Lucia Salari; Andrea Galluzzi; Marianne Najm Abou-Jaoude (Sophia University Institute).
2025–2026 Post-doctoral evaluation committee: A. Borghesi (Sophia University Institute).

Organisation of Scientific Meetings

2026 XXIX Urbino International Summer School in Philosophy of Physics — *History and Philosophy of the Wave Function*, 15–19 June 2026. Co-organiser (with N. Covoni).
2026 *Relational Quantum Mechanics and the Ontology of Physical Reality*, international workshop, SILFS-sponsored. Co-organiser (with N. Covoni).
2025 XXVIII Urbino International Summer School in Philosophy of Physics — *Epistemology of Quantum Gravity*. Co-organiser.
2024 XXVII Urbino International Summer School in Philosophy of Physics — *Philosophy of Dark Energy*. Co-organiser.
2024 *Artificial Intelligence: Towards a Digital Oath*, Sophia University Institute. Coordinator of the Scientific Programme.
2023 XXVI Urbino International Summer School in Philosophy of Physics — *Philosophy of Dark Matter*. Co-organiser.
2023 Blaumann Foundation Conference — *Quantum Gravity with(out) Experiments*, Urbino. Main organiser.
2022 XXV Urbino International Summer School in Philosophy of Physics — *Dualities Between Physics and Philosophy*. Co-organiser.
2021 XXIV Urbino International Summer School in Philosophy of Physics — *Black Holes and the Information Loss Paradox*. Co-organiser.

Grants and Research Funding

2026–2029 **ICTS founding programme** — EUR 180,000 over three years, funded by Sophia University Institute and ASCES-UNITA. Role: founding Director.
2024–2026 **Porticus** — Grant GR-077082, Sophia University Institute (Post-Doctoral School), EUR 380,000 over three years. Role: Director of the Post-Doctoral School; assumed management of the grant in 2024.
2022 **Blaumann Foundation** — winner of the Foundation's first call for projects in the foundations of physics. EUR 10,000.

Institutional Roles and Academic Service

since 2026 **Vice Rector**, Sophia University Institute.
since 2026 **Director, Doctoral School**, Sophia University Institute.
since 2026 **Director, ICTS** — International Center for Transdisciplinary Studies, Sophia University Institute (founding director, May 2026).
since 2025 **Rector's Delegate** for Strategic Planning; for Research, Chairs and Strategic Agreements; and for Site and Teaching-Infrastructure Planning.

since 2024	Director of Research and Director of the Post-Doctoral School , Sophia University Institute.
since 2024	Vice-President , Board of Directors, Fondazione per Sophia.
since 2023	Scientific Director , <i>The AI Oath</i> — international initiative developing a professional oath for the design and deployment of artificial intelligence, with Fadi Chehadé (former CEO, ICANN). Research Lead and board member, The AI Oath Institute (California, 2026).
2023–2025	Director , Pasquale Foresi Library, Sophia University Institute.

Editorial Boards, Refereeing and Memberships

since 2024	Editorial Board , <i>Sophia: Research on Fundamentals and Correlation of Knowledge</i> .
since 2022	Scientific Committee , <i>Nuova Secondaria</i> (philosophy and science).
Refereeing	<i>European Journal for Philosophy of Science</i> ; <i>Synthese</i> ; <i>Foundations of Physics</i> ; <i>Humanities and Social Sciences Communications</i> ; <i>Philosophical Inquiries</i> ; <i>Quantum Reports</i> ; <i>Sophia</i> .
Memberships	Philosophy of Physics Society (since 2024); Società Italiana degli Storici della Fisica e dell’Astronomia, SISFA (since 2025); Società Nuovo SEFIR (since 2023); Fellow, Blaumann Foundation (since 2022); British Society for the Philosophy of Science, BSPS; European Philosophy of Science Association, EPSA; Società Italiana di Logica e Filosofia delle Scienze, SILFS (all since 2021).

Languages

Italian (native) · English (fluent, C1) · Romanian (B1)