



Andrea Zingarofalo

Curriculum Vitae et Studiorum

About Me

Theoretical physicist with a strong interest in the foundational and information-theoretic aspects of quantum theory. My work focuses on quantum phenomena such as entanglement and nonlocality, and their implications for both fundamental physics and emerging technologies.

Personal Details

Name Andrea Zingarofalo
Birth date November 11, 2001
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Nationality Italian

Education

- Oct 2020 – **Allievo del corso ordinario**, *Advanced School ISUFI* (Excellence Program)
Nov 2025 ~ 10% Acceptance rate for the Natural Sciences Class in 2020.
Key modules: Group Theory and Symmetries, Celestial Mechanics, Astroparticle Physics, Applied Physics I-II, Philosophy of Science, ICT for Research, Public Speaking, Scientific Writing.
- Sep 2024 – **Erasmus program**, *École normale supérieure*, Master ICFP (International Center for
Jan 2025 Fundamental Physics) M2, Theoretical Physics Track
Modules: General Relativity, Quantum Field Theory, Statistical Field Theory, Algorithms and Computations.
- Oct 2023 – **MSc in Theoretical Physics**, *University of Salento*, 110/110 cum laude, GPA: 29.8/30
Jul 2025 Key modules: Quantum Field Theory I-II, Quantum Chromodynamics, Statistical Mechanics, Many-Body Physics, Quantum Information and Computing, Physics of Complex Systems, Data Analysis, Mathematical Methods for AI.
Research Thesis: *Exploring the Boundaries of Quantum Correlations: Bell Inequalities, Convex Duality, and Self-Testing*. Advisors: Prof. L. Martina and Prof. J.-D. Bancal
- Sep 2020 – **BSc in Physics**, *University of Salento*, 110/110 cum laude, GPA: 30/30
Oct 2023 Electives: Nuclear Physics, Astronomy and Astrophysics, Foundations of Physics.
Research Thesis: *Study of One-Dimensional Quantum Integrable Systems via the Bethe Ansatz Techniques*. Advisor: Prof. L. Martina
- Sep 2015 – **High School Diploma**, *Liceo Scientifico V. Lilla*, 100/100 cum laude, Oria (BR)
Jun 2020 Activities: student ambassador

Experience

- Mar – Jul 2025 **Research Intern**, *Institut de Physique Théorique*, CEA Paris-Saclay, working on the geometry of quantum correlations and quantum statistics in the Quantum Information Theory group. Supervisor: Prof. J.-D. Bancal
- Mar – Jul 2024 **Research Intern**, *University of Salento*, working on integrability of nonlinear PDEs in the Mathematical Physics group, in collaboration with the University of Glasgow. Supervisor: Prof. L. Martina
- 2019 – 2025 **Private Tutor** in Mathematics, Physics, and Chemistry for high school and university students

Publications

Journal Articles

- [1] F. Giglio, G. Landolfi, L. Martina, and **A. Zingarofalo**. Integrability properties and multi-kink solutions of a generalised Fokker-Planck equation. *Journal of Physics A: Mathematical and Theoretical*, 58(16):165202, April 2025.

Communication and Outreach

- [2] **A. Zingarofalo**. Il conflitto tra meccanica quantistica e senso comune. https://www.treccani.it/magazine/chiasmo/scienze_naturali_e_tecnologia/54-conflitto/conflitto_zingarofalo_ISUFI.html, 2024. Published on Il Chiasmo by Treccani, the Italian Encyclopaedia Institute.
- [3] **A. Zingarofalo**. Il ruolo delle simmetrie nel problema di Keplero. In D. Avaro and F. Decataldo, editors, *Rete di Idee, Udine 2022*, pages 81–100, Udine, 2023. Forum Editrice.

Schools and Training

Domain-Specific Training

- 2025 **Interdisciplinary Statistical Physics workshop**, University of Salento, Lecce, 18–19 Sep
- 2025 **Qiskit Global Summer School**, IBM, 7–22 Jul
- 2025 **Summer School “Mathematical Aspects of Quantum Information” (MAQI)**, Université Paris-Saclay and Institut Polytechnique, Paris, 16–20 Jun
- 2024 **Summer School “Theoretical Physics of Fundamental Interactions”**, Scuola Normale Superiore and Scuola Galileiana di Studi Superiori, Pisa, 27–31 May
- 2019 **Physics Summer School**, University of Salento, Lecce, 2–6 Sep
- 2018 **International Cosmic Day Masterclass**, INFN (Italian Institute of Nuclear Physics) and University of Salento, Lecce, 29 Nov
- 2018 **Stage at Asiago Astrophysical Observatory**, INAF (Italian Institute of Astrophysics) and University of Padua, Asiago, 9–13 Jul
- 2016 **Summer School on Astronomy**, INAF and SAI (Italian Astronomical Society), Sant’Agata sui Due Golfi, 5–8 Jul

Others

- 2023 **Summer School “Reframing Sustainability: Bridging Environmental, Energy and Economical Challenges”**, Advanced School ISUFI, Otranto, 10–12 Sep
- 2023 **Winter School “Green and Digital Transition in Europe”**, ENCATC (European Network of Cultural Administration Training Centres), Brussels, 2–7 Dec
- 2019 **University Orientation School**, Scuola Normale Superiore and Accademia Nazionale dei Lincei, Rome, 8–13 Jul

Awards and Scholarships

- 2025 Winner of the “ISUFI Research & Innovation” scholarship for international research mobility
- 2024 – 2025 Winnner of a scholarship at Cité Internationale Universitaire de Paris
- 2022 Winner of RIASISSU “Rete di Idee”, X edition, Udine
- 2020 – 2025 Winnner of the ISUFI Merit Scholarship at University of Salento, covering accomodation and a salary
- 2018 Senior finalist at XVI Italian Astronomy Olympiads
- 2016 – 2020 Participant at Astronomy, Mathematics, and Physics Olympiads

Talks and Posters

- 2025 **Orthogonal Faces in the CHSH Scenario** (poster), MAQI School, Paris, 18 Jun
- 2025 **Exploring the Boundaries of Quantum Correlations** (talk), *IPhT Quantum Meetings*, Institut de Physique Théorique, CEA Paris-Saclay, Paris, 6 Jun

Technical Skills

Programming and Scientific Computing

- Programming Bash, C, C++, Python
- Computing Mathematica, MATLAB, NumPy, SciPy, Matplotlib
- Data Analysis ROOT framework for data analysis, **pandas**, **uncertainties**, basic knowledge of machine learning and neural networks using **scikit-learn** and **TensorFlow**
- Quantum **Qiskit** and **PennyLane** for quantum computing simulations; experience with semidefinite programming and quantum optimization workflows using **CVXPY**, **MOSEK**, and **ncpol2sdpa**.
- Libraries
- Tools **L^AT_EX**, Markdown, **git**, Microsoft Office Suite, Inkscape
- Systems Basic experience with UNIX-based systems, shell scripting, and system management.

Communication and Teamwork

Excellent interpersonal and communication skills, demonstrated through frequent collaboration with peers and presentation of technical work to diverse audiences.

Languages

- Italian Native language
- English C1, Full professional proficiency
- French B2, Intermediate proficiency
- German A2, Elementary proficiency
- Latin Elementary proficiency

Memberships and Affiliations

- Since 2023 Member of the SIF (Italian Physical Society).
- Since 2020 Member of RIASISSU (Italian Network of Students from Excellence Schools).

Additional Information

- Music Guitar Grade 2 (Distinction), Trinity College of London.
- Personal Amateur astronomer, speaker at *XXXVII Meeting Regionale degli Astrofili Pugliesi*. Participant in several astronomy stages organized by INAF and SAI.
- Interests
- Driving AM, B
- Licenses