# 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

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| Name | Andrea Zingarofalo |
| Birth date | November 11, 2001 |
| Address | c/da Masone s.n.c., Oria (BR), Italy |
| Phone | (+39) 327 615 4487 |
| Email | andrea.zingarofalo@gmail.com |
| Nationality | Italian |

## Education

**Oct 2020 – Nov 2025**
**Allievo del corso ordinario**, *Advanced School ISUFI* (Excellence Program)
$\sim$ 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 – Jan 2025**
**Erasmus program**, *École normale supérieure*, Master ICFP (International Center for Fundamental Physics) M2, Theoretical Physics Track
Modules: General Relativity, Quantum Field Theory, Statistical Field Theory, Algorithms and Computations.

**Oct 2023 – Jul 2025**
**MSc in Theoretical Physics**, *University of Salento*, 110/110 cum laude, GPA: 29.8/30
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 – Oct 2023**
**BSc in Physics**, *University of Salento*, 110/110 cum laude, GPA: 30/30
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 – Jun 2020**
**High School Diploma**, *Liceo Scientifico V. Lilla*, 100/100 cum laude, Oria (BR)
Activities: student ambassador

## Experience

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| 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

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| 2025 | **Interdisciplinary Statistical Physics** workshop, University of Salento, Lecce, 18–19 Sep |
| 2025 | **Qiskit Global Summer School**, IBM, 7–22 Jul |
| 2025 | **Summer School on "Mathematical Aspects of Quantum Information" (MAQI)**, Université Paris-Saclay and Institut Polytechnique, Paris, 16–20 Jun |
| 2024 | **Summer School on "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 Astrophysical Observatory of Asiago**, INAF (Italian Institute of Astrophysics) and University of Padua, Asiago, 9–13 Jul |
| 2016 | **Summer School on Astronomy**, INAF and SAIt (Italian Astronomical Society), Sant'Agata sui Due Golfi, 5–8 Jul |

### Others

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| 2023 | **Summer School on "Reframing Sustainability: Bridging Environmental, Energy and Economical Challenges"**, Advanced School ISUFI, Otranto, 10–12 Sep |
| 2023 | **Winter School on "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

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| 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

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| 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

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| 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 Libraries | Qiskit and PennyLane for quantum computing simulations; experience with semidefinite programming and quantum optimization workflows using CVXPY, MOSEK, and ncpol2sdpa. |
| Tools | LaTeX, 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

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| Italian | Mother tongue |
| English | C1, Full professional proficiency |
| French | B2, Intermediate proficiency |
| German | A2, Elementary proficiency |
| Latin | Elementary proficiency |

## Memberships and Affiliations

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

## Additional Information

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