Mauro Giliberti, Ph.D.

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https://www.researchgate.net/profile/Mauro-Giliberti
https://cu2mauro.github.io

Work Experience

2026 – current ■ **PostDoc**, Goethe University Frankfurt.
CRC-TR211 collaboration, DFG funded.

Academic Background

2023 – 2025 **Ph.D. Università degli Studi di Firenze**, Physics and Astronomy department.
Thesis defended Mar 2026, Doctor Europaeus certification.
Doctoral thesis: *Numerical Methods for High Energy Theoretical Physics and Astrophysics*.
Advisor: Aldo Lorenzo Cotrone.

2019 – 2022 **M.Sc. Università degli Studi di Firenze**, Scienze Fisiche e Astrofisiche - Fisica Teorica.
Graduated Dec 2022 with 110/110 cum laude.
Thesis: *Numerical Study of Bubble Dynamics in Holographic False Vacuum Decay*.
Advisor: Aldo Lorenzo Cotrone.
Co-advisors: Francesco Bigazzi, Bruno degli Esposti.

2016 – 2019 **B.Sc. Università degli Studi di Firenze**, Fisica e Astrofisica.
Graduated Oct 2019 with 107/110.
Thesis: *Effective One-Body Theory in General Relativity*.
Advisor: Domenico Seminara.

Publications

Articles

1. Y. Bea, M. Giliberti, D. Mateos, M. Sanchez-Garitaonandia, A. Serantes, and M. Zilhão, "Bubble dynamics in a QCD-like phase diagram," *JHEP*, vol. 04, p. 013, 2026. DOI: 10.1007/JHEP04(2026)013. arXiv: 2412.09588 [hep-th].
2. D. Chatzis, A. Fatemiabhari, M. Giliberti, and M. Hammond, "Holographic entanglement entropy in quiver theories," Sep. 2025. arXiv: 2509.19434 [hep-th].
3. M. Giliberti, A. Fatemiabhari, and C. Nunez, "Confinement and screening via holographic Wilson loops," *JHEP*, vol. 11, p. 068, 2024. DOI: 10.1007/JHEP11(2024)068. arXiv: 2409.04539 [hep-th].

Software

1. M. Giliberti and B. Degli Esposti, *Numerical optimization with splines in high energy physics*, 2026. arXiv: 26XX.XXXXX.
2. M. Giliberti, *Robinhood.jl*, 2024. DOI: 10.5281/zenodo.13758659.

Fellowships and Scholarships

2025 – 2026 Università degli Studi di Firenze - "Marco Ademollo fellowship for Theoretical Physics" - Project PAGVARIDIPA.

Fellowships and Scholarships (continued)

2023 – 2025 European Union - Next Generation EU - National Recovery and Resilience Plan (NRRP) - M4C2 CN1 Spoke2 - Research Programme CN00000013 “National Centre for HPC, Big Data and Quantum Computing” - CUP B83C22002830001.

Experience

Talks, Posters and Scientific Visits

2025
- **Seminar** BCTP Bonn.
- **Visit and seminar** ITP Frankfurt.
- **Visit and seminar** ITP Utrecht.
- **Visit and seminar** HIP Helsinki.
- **Poster** "Simulating bubbles in a Holographic QCD-like phase diagram", ICHA4, Baku (Best Poster award).
- **Talk** "Numerical solution of holographic observables in quiver theories", AANL Yerevan.
- **Poster** "Simulating bubbles in a Holographic QCD-like phase diagram", Supercalcolo, Data Science e AI: dall’innovazione al trasferimento tecnologico, Firenze (Best Poster award).
- **Talk** "Numerical Methods for Holography", New Frontiers in Theoretical Physics - XXXVIII, Cortona.

2024
- **Talk** "Supercomputing and Big Data: new technology for new research horizons (Fundamental Research and Space Economy)", Festival della Scienza di Genova.
- **Poster** "Simulating the HQCD phase diagram", COST Action 22113 kick-off meeting, Padova.
- **Talk** "Why do we need a supercomputer to study boiling water?", Workshop «L’Università di Firenze al passo con il futuro del supercalcolo e dei big data», Firenze.

2023
- **Poster** "Holographic vacuum decay: a numerical study", HPC Summer School, Pavia.
- **Visit** ICCUB Barcelona.
- **Fire Talk** New Frontiers in Theoretical Physics - XXXVII, Cortona.

Conference and School Attendance

2026
- **CRC Retreat**, GSI Bonn.

2025
- **Julia and the Jecco module**, ICCUB.
- **Second Holography and Dense Matter Workshop**, APC Paris.
- **International Conference on Holography and its Applications**, Damghan University.
- **New Frontiers in Theoretical Physics - XXXVIII**, INFN.
- **AI4Phys workshop on "Artificial Intelligence for Physical Sciences"**, GGI.

2024
- **COST Action 22113 kick-off meeting**, UniPd.
- **Julia High Performance**, CINECA.

2023
- **XIX AVOGADRO MEETING on Strings, Supergravity and Gauge Theories**, UniPd.
- **LACES Winter School**, GGI.
- **Cross-Collserola PhD Meeting in Astrophysics, Cosmology and Particles**, ICCUB.
- **New Frontiers in Theoretical Physics - XXXVII**, INFN.
- **HPC Summer School**, UniPv and CINI consortium.
- **Lectures on the Theory of Fundamental Interactions**, GGI.

2022
- **Reconstructing the Gravitational Hologram with Quantum Information**, GGI.

Experience (continued)

Teaching and Outreach

2025 **Participation at FameLab selections**, Ferrara.
Presenting research topics to the general public, winning the audience award.

Assistant professor for Physics, UniFi.
Tutoring physics, optics, and computer science bachelor students about mechanics, electrodynamics, and quantum physics.

2024 **Moderator for the *Strings in Florence* Journal Club**, UniFi.
Moderating and scheduling the weekly Journal Club, arranging external speakers, as well as discussion and dissertation activities of the team.

2023 **Assistant professor for Physics**, UniFi.
Tutoring engineering bachelor students about mechanics and electrodynamics.

2022 **Substitute teacher for maths and physics**, Liceo Scienfifico Leonardo da Vinci.
Teaching high-school level maths and physic.

2021 **Computer tutor**, UniFi.
Helping students and professors with the newly installed computers in the University's classrooms, about AV, networking, and conference call issues.

2020 **Guide at Museum of Mathematics**, Il Giardino di Archimede.
Showing the different exhibitions of physics and mathematics held at the museum to school groups, Italian and international, of age 10-18.

Skills

Languages — Italian native speaker, fluent in English, leaning Spanish and Japanese

Coding — MATLAB, Julia, Mathematica, C, C++, Python, LaTeX, Git

HPC — Slurm Workload, Leonardo by CINECA, Machine Learning for Scientific Applications

Misc. — Scouts leader in the AGESCI scouting movement (volunteer)

References

Aldo Lorenco Cotrone
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David Mateos
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Universitat de Barcelona
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Carlos Núñez
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Swansea University
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