

PERSONAL INFORMATION

Francesco Tarantelli

 +39 370 1457334 francesco.tarantelli3@unibo.it f.tarantelli@hotmail.com www.github.com/ftarantelli

Gender Male | Date of birth 23 May 1997 | Nationality Italian

ACTUAL POSITION

Feb. 2024 - 2026 PostDoc position

Università di Bologna, Bologna (BO)-Italy

Supervisor Prof. F. Lillo

Nov. 2021 - May 2025 INFN Associate

Istituto Nazionale Fisica Nucleare, Pisa(PI)-Italy

Research topics Liquidity and systemic risks in centralized and decentralized crypto markets;
Analysis of complex and statistical systems using innovative computational techniques (Main techniques: Tensor Networks, Machine Learning, Monte Carlo, Master Equation resolution techniques);

EDUCATION

Nov. 2021 - Oct. 2024 PhD in Theoretical Physics

University of Pisa, Pisa(PI)-Italy

Supervisor Prof. E. Vicari

Sep. 2019 - 26 July, 2021 Master degree in Physics

University of Pisa, Pisa(PI)-Italy

Curriculum Theoretical Physics**Grade** 110 cum Laude/110 cum Laude**Thesis title** "Quantum critical behavior in the presence of dissipative boundaries"**Supervisor** Prof. E. Vicari

Sep. 2016 - 27 July, 2019 Bachelor degree in Physics

University of L'Aquila, L'Aquila(AQ)-Italy

Grade 110 cum Laude/110 cum Laude**Thesis title** "Proprietà di entanglement dello stato fondamentale di fermioni in reticolo"**Supervisors** Prof. S. Ciuchi, Prof. S. Paganelli

PUBLICATIONS

- F. Tarantelli, E. Vicari** **Quantum critical systems with dissipative boundaries**, Physical Review B **104** 075140 (2021), doi: [10.1103/PhysRevB.104.075140](https://doi.org/10.1103/PhysRevB.104.075140), URL: [arxiv:2106.02539v1](https://arxiv.org/abs/2106.02539v1).
- F. Tarantelli, E. Vicari** **Out-of-equilibrium quantum dynamics of fermionic gases in the presence of localized particle loss**, Physical Review A **105** 042214 (2022), doi: [10.1103/PhysRevA.105.042214](https://doi.org/10.1103/PhysRevA.105.042214), URL: [arXiv:2112.05180](https://arxiv.org/abs/2112.05180).
- F. Tarantelli, E. Vicari** **Out-of-equilibrium dynamics arising from slow round-trip variations of Hamiltonian parameters across quantum and classical critical points**, Physical Review B **105** 235124 (2022), doi: [10.1103/PhysRevB.105.235124](https://doi.org/10.1103/PhysRevB.105.235124), URL: [arXiv:2205.08333](https://arxiv.org/abs/2205.08333).
- F. Tarantelli, E. Vicari** **Thermal bath effects in quantum quenches within quantum critical regimes**, Physical Review B, **108** 035128 (2023), doi: [10.1103/PhysRevB.108.035128](https://doi.org/10.1103/PhysRevB.108.035128), URL: [arXiv:2305.05494](https://arxiv.org/abs/2305.05494).
- A. Franchi, F. Tarantelli** **Liouvillian gap and out-of-equilibrium dynamics of a sunburst Kitaev ring: from local to uniform dissipation**, Physical Review B, **108** 094114 (2023), doi: [10.1103/PhysRevB.108.094114](https://doi.org/10.1103/PhysRevB.108.094114), URL: [arXiv:2303.04207](https://arxiv.org/abs/2303.04207).
- F. Tarantelli, S. Scopa** **Out-of-equilibrium scaling behavior arising during round-trip protocols across a quantum first-order transition**, Physical Review B, **108** 104316 (2023), doi: [10.1103/PhysRevB.108.104316](https://doi.org/10.1103/PhysRevB.108.104316), URL: [arXiv:2305.12993](https://arxiv.org/abs/2305.12993).
- L. Del Debbio, M. Naviglio, F. Tarantelli** **Neural Networks Asymptotic Behaviours for the Resolution of Inverse Problems**, arXiv **2402.09338** (2024), URL: [arXiv:2402.09338](https://arxiv.org/abs/2402.09338).

TALKS

- Dec 2022, Bari (IT)** Talk contribution in the International conference "SM&FT 2022 - The XIX Workshop on Statistical Mechanics and nonperturbative Field Theory"
- Website** agenda.infn.it/smft22

CONFERENCES

- Feb 2024** "Workshop on Quantum Simulators of the Future: From Dynamical Gauge Fields to Lattice Gauge Theories" at ICTP-Trieste

HONORS AND AWARDS

- June 2014** Admission and Participation in the Summer School for Experimental Sciences at the "Laboratori Nazionali del Gran Sasso (LNGS)" - IV Edition
- April 2016** Bronze medal winner at the XXX edition of National Olympics of Physics (AIF)
- Sep. 2019 - July, 2021** Scholarship winner for DSU Toscana

PHD SCHOOLS

- 2 - 7 July, 2022** Admission and Participation on the International School of Physics "Enrico Fermi" course on "QUANTUM FLUIDS OF LIGHT AND MATTER - QFLM2022" organized by "Società Italiana di Fisica (SIF)"
- 25 - 29 July, 2022** Admission and Participation on "2022 SQMS GGI Summer School on quantum simulation of field theory" in Florence(IT) organized by the "Galileo Galilei Institute for Theoretical Physics"
- 6 - 17 Feb, 2023** Admission and Participation on "2023 SFT GGI PhD School on Statistical Field Theory" in Florence(IT) organized by the "Galileo Galilei Institute for Theoretical Physics" and sponsored by Simons Foundation
- 4 - 6 Sep, 2023** Participation on "Summer School in Economic, Social and Financial Networks" in Università LaSapienza (Rome, IT) organized by the "AMASES" and "Università LaSapienza"
- 4 - 6 Sep, 2023** Admission and Participation on "Fifth edition of the Machine Learning @ INFN (ML_INF_N) advanced level hackathon" in INFN Pisa (Pisa, IT) organized by the "Istituto Nazionale Fisica Nucleare (INFN)"
- Website** [ml-infn-hackathons](https://ml-infn-hackathons.github.io/)
- 14 - 19 July, 2024** Participation on "Summer School in Machine learning methods for finance" in Bertinoro (Forlì-Cesena, IT) organized by the "AMASES" and "SoBigData++"

ORGANIZER

- 15 - 17 Feb. 2023** Organizer and web developer of the Workshop "New Physics Signals (NePSi): from Theory to Experiments" at "Università di Pisa"
- Sponsors** Pisa Municipality, Università di Pisa and INFN
- Website** agenda.infn.it/e/nepsi23
- 18 - 20 Oct. 2023** Organizer and web developer of the Workshop "INSIGHTS, Innovative Systems In radiation therapy: breakthroughs novel detectors, Treatments and AI techniques" at "Università di Pisa"
- Sponsors** Pisa Municipality, Università di Pisa and INFN
- Website** agenda.infn.it/e/insights2023
- 24 - 27 Oct. 2023** Organizer and web developer of the Workshop "GravityShapePisa (GraSP): New Frontiers in Gravity Phenomenology" at "Università di Pisa"
- Sponsors** Pisa Municipality, Università di Pisa and INFN
- Website** agenda.infn.it/e/grasp23
- 24 - 27 Sept. 2024** Organizer and web developer of the Conference "Physics in the Artificial Intelligence Era" at "Università di Pisa"
- Sponsors** Pisa Municipality, Università di Pisa, Scuola Normale Superiore and INFN
- Website** agenda.infn.it/e/phyAlera

TEACHING ACTIVITY

- Feb. 2023 - May 2023** **Assistant Professor**
Teaching and tests assistant for the course on "General Physics" for the bachelor degree in Agricultural Sciences at Università di Pisa.
- Feb. 2024 - May 2024** **Assistant Professor**
Teaching and tests assistant for the course on "General Physics" for the bachelor degree in Agricultural Sciences at Università di Pisa.

SERVICE ACTIVITY

Nov. 2021 - Nov. 2023 Representative of PhD students in Physics

DIGITAL SKILLS

Advance Programming language Bash, C++, Python, Fortran 90, C

Basic Programming language JavaScript, Solidity, CSS, R

Other programs Gnuplot, Latex, OpenMP, PennyLane

Operating System (OS) Linux/Ubuntu, Linux on High Performance Computing, Microsoft

LANGUAGE SKILLS

Certificate ERP Course - English for Research Publication and Presentation Purposes

Level C1 Level (CEFR)

Institution Pisa University