

SIMONE RONCALLO

Quantum Scientist and Technology Enthusiasts

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Italian (Native) – English (Proficient)



SUMMARY AND PROFESSIONAL OBJECTIVE

I am a **Physics PhD Candidate** in **Quantum Computing** and **Quantum Technologies**. My professional objective is to work in a scientific and technology-oriented environment, applying the **mathematical** and **computational skills** I have acquired so far and contributing to our technological development. I always search for something new to learn and discover, easily getting passionate about new topics and projects, especially when they involve a multidisciplinary point of view.

STRENGTHS AND TECHNICAL SKILLS

Coding & Scientific Programming
Experience in classical and **quantum** algorithms, Monte-Carlo simulations, **deep learning** and image processing. **Python** and **MATLAB** proficiency for numerical and analytic calculations.

Research
Autonomous and collaborative research activity: from project ideation, design and execution. Active involvement in national and international collaborations. Supervision of Master's research projects. Contribution in funding acquisition.

Report Writing & Communication
First-authored publications and technical report writing. Oral contributions to international conferences, seminars and general public events. See simoneroncallo.com for a detailed list.

CORE EXPERIENCE

Researcher PhD Candidate in Physics

@ **University of Pavia - Quantum Information Theory Group**

Jan 2022 – Jan 2025

Pavia, Italy

Research, development and test of **algorithms** and protocols for:

- Quantum **computing** and **image processing**;
- Quantum imaging and interferometry;
- Channel tomography and deconvolution;
- Deep learning** for quantum data.

Fundamental research on quantum time and **arrival time** distributions. Contributor to the PRIN Project 2022RATBS4.

Oral contributions to international conferences and workshops. Proactive engagement in scientific outreach events and talks.

Cosupervision of S.M.'s Master thesis "Qudit noise deconvolution", and E.T.'s Master thesis "Compression algorithms in quantum image processing".

PROFESSIONAL DEVELOPMENT

Mathematical Foundations of Quantum Machine Learning
@ University of Trento – Jul 2023

Deep Learning and Computer Vision
@ MaLGa (Machine Learning Genoa Center) – Jun 2023

First Certificate in English
@ University of Cambridge ESOL Examinations – Jul 2014

Complete record available at [linkedin.com/in/simoneroncallo](https://www.linkedin.com/in/simoneroncallo).

EDUCATION

PhD in Physics

@ **University of Pavia, Italy**

Jan 2022 – Jan 2025

Quantum Information and Technologies
Supervisors: Prof. Lorenzo Maccone and Prof. Chiara Macchiavello

Master's Degree in Physics

@ **University of Genoa, Italy**

Sept 2018 – 28 Oct 2020

110 L / 110 (Summa cum Laude)

Theoretical and Mathematical Physics
Advisor: Prof. Nicola Pinamonti

Bachelor's Degree in Physics

@ **University of Genoa, Italy**

Sept 2015 – 24 Oct 2018

110 L / 110 (Summa cum Laude)

Scientific High School Degree

@ **LS Enrico Fermi, Genoa, Italy**

Sept 2010 – 09 Jul 2015

100 / 100

COMPUTATIONAL SKILLS

Scientific Programming

Python

[Standard Library, NumPy, Qiskit, Keras, TensorFlow, SymPy, SciPy, Matplotlib]

MATLAB [Standard, Symbolic Math Toolbox]

Wolfram Mathematica

C++

Excel, SciDAVis

Editing and Design

LaTeX, HTML, CSS

Inkscape, GIMP, Raw Development

Word, PowerPoint

📖 PUBLICATIONS AND MANUSCRIPTS

Articles (9 research papers of which 6 first-authored):

- [9] E. Tumbiolo, **S. Roncallo**, L. Maccone and C. Macchiavello, In Preparation (2024)
- [8] L. Maccone, **S. Roncallo** and K. Sacha, Quantum measurements of time: a reply to criticisms, In Preparation (2024)
- [7] **S. Roncallo**, X. Lu and L. Maccone, Interferometric binary phase estimations (Preprint), [arXiv:2407.10966](https://arxiv.org/abs/2407.10966)
- [6] **S. Roncallo**, A. R. Morgillo, C. Macchiavello, L. Maccone and S. Lloyd, Quantum optical classifier with superexponential speedup (Preprint), [arXiv:2404.15266](https://arxiv.org/abs/2404.15266)
- [5] **S. Roncallo**, L. Maccone and C. Macchiavello, Quantum JPEG, *AVS Quantum Sci.* **5**, 043803 (2023)
- [4] **S. Roncallo**, L. Maccone and C. Macchiavello, Pauli transfer matrix direct reconstruction: channel characterization without process tomography, *Quantum Sci. Technol.* **9** 015010 (2024)
- [3] **S. Roncallo**, L. Maccone and C. Macchiavello, Multiqubit noise deconvolution and characterization, *Phys. Rev. A* **107**, 022419 (2023)
- [2] **S. Roncallo**, K. Sacha and L. Maccone, When does a particle arrive?, *Quantum* **7**, 968 (2023)
- [1] P. Meda, N. Pinamonti, **S. Roncallo** and N. Zanghì, Evaporation of four-dimensional dynamical black holes sourced by the quantum trace anomaly, *Class. Quantum Grav.* **38** 195022 (2021) [Corrigendum: *Class. Quantum Grav.* **39** 059501 (2022)]

Manuscripts:

- [1] **S. Roncallo**, Quantization of gravitational radiation over a Schwarzschild spacetime and its semiclassical backreaction: A model of black hole evaporation, Master's Degree Thesis in Physics (2020) | [Link](#)

Complete record available at simoneroncallo.com/publications.

👤 TALKS AND CONTRIBUTIONS

Conferences (1 invited and 3 contributed talks):

- [5] ICSC Quantum Computing Annual Meeting - [Polytechnic University of Milan](#), 04 Sep 2024 | Talk
- [4] Workshop on Non-Equilibrium Quantum Many-Body Systems - [University of Genoa](#), 11 Jul 2024 | Contributed Talk
- [3] QTML 2023 - [CERN](#), Geneva, 22 Nov 2023 | Contributed Talk
- [2] Quantum 2023 - [University of Turin](#), 15 Sep 2023 | Contributed Talk
- [1] Third Kyoto Workshop on Quantum Information, Computation, and Foundations - [Yukawa Institute for Theoretical Physics](#), Kyoto University, 19 Oct 2022 | Invited Remote Talk

Seminars:

- [7] [University of Milan](#), 14 Nov 2024 | Invited Talk
- [6] [Quandela](#), Paris, 05 Jun 2024 | Invited Remote Talk
- [5] [ICTP](#), Trieste, 27 Feb 2024 | Talk
- [4] PhD EOY Seminar 2023 - [University of Pavia](#), 19 Sep 2023 | Departmental Talk
- [3] Center for Convergent Technologies, [IIT](#), Genoa, 7 Jul 2023 | Talk
- [2] Quantum Technologies Lab, [Leonardo Labs](#), 9 Nov 2022 | Remote Talk
- [1] PhD EOY Seminar 2022 - [University of Pavia](#), 30 Sep 2022 | Departmental Talk

Outreach:

- [3] [Casa di Quartiere 13D Certosa](#), Genoa. 1 Dec 2023 | Talk
- [2] Modern Physics Meetings - [University of Pavia](#), 29 Nov 2022 | Talk with F. Scala
- [1] Man on the Moon - [ORSA](#), University of Genoa 18 - 20 Jul 2019 | Poster with G. Manco and B. Valerio

Complete record available at simoneroncallo.com/talks.

🔗 PROJECTS

Featured:

- [5] **S. Roncallo**, [Link tiqt2025.quantummechanics.it](https://tiqt2025.quantummechanics.it) (2024 - Ongoing) [HTML, CSS]
- [4] **S. Roncallo**, GitHub [simoneroncallo/binary-phase-estimation](https://github.com/simoneroncallo/binary-phase-estimation) (2024) [Qiskit, NumPy]
- [3] A. R. Morgillo and **S. Roncallo**, GitHub [simoneroncallo/quantum-optical-neuron](https://github.com/simoneroncallo/quantum-optical-neuron) (2024) [TensorFlow, Numpy]
- [2] **S. Roncallo**, GitHub [simoneroncallo/quantum-jpeg](https://github.com/simoneroncallo/quantum-jpeg) (2023) [Qiskit, NumPy, SymPy]
- [1] **S. Roncallo**, [Link www.simoneroncallo.com](https://www.simoneroncallo.com) (2022 - Ongoing) [HTML, CSS]

TEACHING EXPERIENCES

Teaching Assistant

@ **University of Pavia**

📅 Sept 2022 – Sept 2024

📍 Pavia, Italy

Examiner in the Physics II board as part of the Mathematics Bachelor of Science (BSc) programme.

Maths and Physics Teacher

@ **Deledda International School**

📅 May 2021 – Dec 2021

📍 Genoa, Italy

Mathematics and Physics classes within the International Baccalaureate (IB) programme. Lectures in English.

OTHER EXPERIENCES

Physics Tutor

@ **University of Genoa**

📅 Mar 2020 – Jul 2020

📍 Genoa, Italy

Physics review classes for the Geology Bachelor of Science (BSc) programme.

Science Communicator

@ **Genoa Science Festival**

📅 Oct 2019 – Nov 2019

📍 Genoa, Italy

Scientific outreach at the intergenerational exhibition "Siamo figli degli stelle" (Edition 2019).