

Gabriele Roller

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EDUCATION

ETH Zürich

MSc Quantum Engineering

Zürich, CH

2023 - Present

Politecnico di Milano

BSc Engineering Physics

- 110/110 cum laude
- Student rep in the Engineering Physics council.

Milan, IT

2020 - 2023

École Polytechnique Fédérale de Lausanne

Visiting student, Physics

Lausanne, CH

September 2022 - February 2023

- GPA 5.97/6

• Courses focused on nonlinear/quantum optics, laser systems and machine learning.

WORK & RESEARCH EXPERIENCE

EQuS – Massachusetts Institute of Technology

Master Thesis student

Cambridge, USA

May 2025 – March 2026

- I worked in Prof. Oliver's group in the Bosonic team which is developing GKP qubits in planar superconducting resonators.
- I lead the team efforts towards a two-qubit gate between GKP states in our planar architecture, this involved a choice of coupler and interaction, requiring detailed simulation of the protocol's Hamiltonian dynamics. I designed multiple iterations of the two-qubit chip, performed EM simulations of the chip components and followed the fabrication process.
- I characterized the chip and carried out measurements of the building blocks of the two-qubit gate protocol, the results of which guided subsequent redesigns.

Alice&Bob

Experimental Quantum Internship

Paris, FR

September 2024 – March 2025

- Cat-Qubit Calibration, Pulse Optimization, and Simulation

Quantum Device Lab – ETHZ / Paul Scherrer Institut

Semester project student

Zürich, CH

March 2024 – June 2024

- I worked in Prof. Wallraff's group in the Quantum Computation team. The team aims to advance QC with Superconducting Circuits across multiple state-of-the-art physical setups.
- I upgraded the control electronics necessary for the operation of the new 43-qubit chip which will ultimately allow for the entanglement of two logical qubits as aimed in the ELQ program from IARPA.
- I physically integrated new RF equipment in the setup and implemented new software features to adjust to the larger setup.

Laboratory for Quantum and Nano-Optics – EPFL

Lab Assistant

Lausanne, CH

October 2022 – January 2023

- I worked in Prof. Galland's lab on a setup to measure over-biased emission of nanoscale molecular junctions. I helped build the apparatus, optimizing the measurement workflow, and operated the

instrumentation to acquire the necessary data. The system combines electronic transport and spectroscopic techniques to measure vibrational and charge dynamics of molecules in plasmonic nanocavities.

- Our work was published as Amirtharaj, S.P., Xie, Z., See, J.S., Rolleri, G., Chen, W., Bouhelier, A., Lortscher, E., & Galland, C. (2023). Light Emission and Conductance Fluctuations in Electrically Driven and Plasmonically Enhanced Molecular Junctions.

EnginSoft S.p.A.

Internship

Trento, IT

2022 - 2023

- Collaborated with EnginSoft on the OPTIMA project, directed at obtaining performance improvements through FPGA integration in HPC systems.
- Optimized a fluid dynamics simulation library using the Lattice Boltzmann Method on FPGA equipped systems located at the Jülich Supercomputing Centre.

Lista Aperta per il Diritto allo Studio – Politecnico di Milano

President

Milan, IT

2021-2022

- Managed a budget of 65k€ for social and cultural student events.
- In this role I organized various activities and international trips, interfacing with administrative staff and businesses, streamlining the usual process.

ACADEMIC AWARDS

International Mobility Scholarship – Politecnico di Milano / EPFL

2022

- Selected as one of the two students to receive funding for a mobility program to EPFL

“Best Freshmen Prize” – Politecnico di Milano

2022

- Yearly prize awarded to the best performing freshmen (about 200 out of ~7500)

“Merit Scholarship for students enrolled during the 2020/2021 AY” – Politecnico di Milano

1st place

2021

- University wide scholarship reserved to 16 new students (out of 7747 freshmen)

SKILLS & INTERESTS

Skills:

- Software Development:
 - C/C++ language and algorithms/data structures
 - Python/MATLAB for general purpose applications and statistical analysis
 - OOP development for large scale libraries
 - FPGA programming using MaxIDE
 - Software version control using Git
 - Programming embedded systems (with the Arduino & Raspberry families)
- CAD (MicroStation)
- Elementary LabView knowledge
- Multiphysics simulation (e.g. E.M. phenomena, ray-tracing, diffusion) using COMSOL
- PCB design using commercial software
- RF circuits design
- PCB soldering

Interests: Amateur landscape photographer, skier, all round technology enthusiast and avid newspaper reader.