

# Maria Gabriela Jordão Oliveira

**Date of Birth:** 21 Aug 2001

**Nationality:** Portuguese

**Gender:** Female

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**GitHub:**

<https://github.com/mgabijo>

## Languages

**Mother Tongue:**

Portuguese

**Other(s) :** English

French

## Digital skills

Microsoft Office | C programming language | Python programming language | Matlab | Tanner EDA | Haskell programming language | GitHub | LaTeX | Qiskit | Machine Learning | Quantum computing | Uppaal

## Publications

2025 **Jet evolution in a quantum computer: quark and gluon dynamics** |Preprint

2023 **The two-site Heisenberg model studied using a quantum computer: A primer** |Published

Oliveira, M. G. J., Antão, T. V. C., Peres, N. M. R. (2024). The two-site Heisenberg model studied using a quantum computer: A didactic introduction. Revista Brasileira de Ensino de Física, 46. <https://doi.org/10.1590/1806-9126-rbef-2024-0129>

2022 **Fitting a Collider in a Quantum Computer: Tackling the Challenges of Quantum Machine Learning for Big Datasets** |Published

Peixoto, M. C., Castro, N. F., Crispim Romão, M., Oliveira, M. G. J., Ochoa, I. (2023). Fitting a collider in a quantum computer: tackling the challenges of quantum machine learning for big datasets. Frontiers in Artificial Intelligence, 6. <https://doi.org/10.3389/frai.2023.1268852>

## Education and training

2024 - Now **Ph.D. in Physics** |Niels Bohr Institute, University of København  
📍 Blegdamsvej 17, 2100 København, Denmark

**Working title:** Simulating the quantum many body-problem on early fault-tolerant quantum devices

2023 **Qiskit Global Summer School 2023 - Quantum Excellence** |IBM

I attended the Qiskit Global Summer School 2023 - Theory to Implementation - and successfully completed the hands-on labs.

**Link:** [https://www.credly.com/badges/b580f672-c0b6-440f-ba4d-9f50818ed667/public\\_url](https://www.credly.com/badges/b580f672-c0b6-440f-ba4d-9f50818ed667/public_url)

2022 - 2024 **Master in Engineering Physics** |University of Minho  
📍 R. da Universidade, Campus de Gualtar, 4710-057, Braga, Portugal

**Final Grade A | National classification** 19/20

2022 **Qiskit Global Summer School 2022 - Quantum Excellence** |IBM

I attended the two-week Qiskit Global Summer School 2022 and successfully completed the hands-on labs.

**Link** <https://www.credly.com/badges/55e76da9-b0e0-4dfa-997a-b526a52ce934>

2021 **Quantum Matter** |Materials & Concepts - Summer School| Summer school

2019 - 2022 **Bachelor in Engineering Physics** |University of Minho  
📍 R. da Universidade, Campus de Gualtar, 4710-057, Braga, Portugal

**Final Grade A | National classification** 18/20

2016 - 2019 **High School** |Escola Secundária Martins Sarmiento  
📍 Alameda Prof. Abel Salazar 7, 4810-247, Guimarães, Portugal

**Field of Study** Science and technology | **Final Grade** 19.3

## Work experience

2023 - 2024 **Quantum Computing at Particle Physics - Student Researcher | LIP - Laboratório de Instrumentação e Física de Partículas**

Development of quantum computing algorithms to simulate jets' in-medium propagation. Both the simulation of SU(3) quarks and gluons were analysed.

Funding: CERN/FIS-PAR/0032/2021

2022 **Quantum Computing and Quantum Machine Learning at High Energy Physics - Student Researcher | LIP - Laboratório de Instrumentação e Física de Partículas**

- Exploring the use of the K-Means clustering algorithm to reduce datasets' size;
- Developing an algorithm to discover the ground state of a Hamiltonian based on the Quantum Phase Estimation algorithm and the Variational Quantum Eigensolver algorithms.

Funding: CERN/FIS-COM/0004/2021

2022 **Intern - Quantum Computing and Quantum Machine Learning at High Energy Physics | LIP - Laboratório de Instrumentação e Física de Partículas**

2014 - 2015 **Volunteer | EB 2/3 João de Meira**

Volunteer work with disabled children.

## Honours and awards

2022 - 2023 **New Talents 2022 | Fundação Calouste Gulbenkian**

I was selected for the Novos Talentos program of Fundação Calouste Gulbenkian. Through this program, I was incentivized to develop scientific research besides my higher education studies

2021 **UMinho Award for Initiation in Scientific Research 2021 – University of Minho**

I am a winner of the Uminho Award for initiation in Scientific Research 2021, with the project "Open and closed Quantum systems in quantum optics and condensed matter" developed in Centro de Física (CF) of Uminho. I wrote a monograph entitled "Decoherence in quantum systems" with the supervision of professor Nuno Peres. I studied decoherence in two level systems in four different ways. I made an analogy with coupled classical oscillators, I studied electric dipoles and their relation with the Bloch sphere and I made an introduction to applications of coherence and quantum computing.

**Link** <https://youtu.be/Xzc5FG8e1zE>

## Communication and outreach

- 2025 **NQCP Algorithms & Applications Days 2025| Oral presentation**  
**Title:** Quantum Block Krylov Subspace Projector: a quantum algorithm for computing low-lying eigenenergies
- 2025 **NQCP Algorithms & Applications Days 2025| Organizer and chair**
- 2025 **Quantum Computing for Natural Science| Poster presentation**  
**Title:** Finding multiple eigenvalues with early fault-tolerant quantum devices
- 2025 **QT4HEP - International Conference on Quantum Technology for High-Energy Physics | Poster presentation**  
**Title:** Jet evolution in a quantum computer: quark and gluon dynamics
- 2024 **UMinho Research and Innovation Open Days | Poster presentation**  
**Title:** Application of quantum computing to quantum chromodynamics
- 2023 **European night of researchers 2023**  
I presented to the general public the activities developed at LIP Minho (Laboratory of Instrumentation and Particle Physics) and the science behind some apparatus, namely a cloud chamber and a spark chamber.