

# SAVERIO MONACO

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## EDUCATION

### RWTH Aachen University & DESY

PhD in Quantum Generative models for High Energy Physics - ENGAGE  
Marie Skłodowska-Curie PhD

Hamburg, Germany

Mar. 2024 – Present

- **Thesis:** Detector Simulation and Jet Clustering for HL LHC with Quantum Computing

### University of Padua

M.Sc. in Computational Physics

Padua, Italy

Sep. 2020 – Sep. 2023

- **Thesis:** Study of Quantum Correlations in LHCb simulated heavy flavour jets
- **Honors:** Magna cum laude

### University of Catania

B.Sc. in Physics

Catania, Italy

Sep. 2016 – Jul. 2020

- **Thesis:** Phase-Space Formulation of Quantum Mechanics

## EXPERIENCE

### Quantum Machine Learning Intern

CERN

Geneva, Switzerland

Apr. 2022 – Aug. 2022

- Explored Quantum Machine Learning techniques for phase detection in the ANNNI spin model.
- Developed and implemented supervised and unsupervised architectures for phase detection.
- Published a Python package under the CERN-IT organization.
- Authored and published a paper on the implemented techniques.

## TECHNICAL SKILLS

**Quantum Computing tools:** PennyLane, Qiskit, Quimb, YAOML.jl

**Programming languages:** Python, Julia, C/C++, SQL, R, VHDL, Agda, TeX, Nix

**Machine Learning libraries:** Jax, Pytorch, Keras

**Other libraries:** Pandas, NumPy, Matplotlib, BeautifulSoup

**Other Tools:** Git, Docker, Vim, Linux, Sphinx, ReadTheDocs

## LANGUAGES SPOKEN

**Mother tongue:** Italian

**Other languages:**

	Understanding	Speaking	Writing	Certificate
English	C1	C1	C1	IELTS Academic: score 7
German	C1	B2	B2	Goethe-Zertifikat: B2
French	B2	B1	B2	EsaBac Diploma

## PRESENTATIONS

- **Poster presentation @ QT4HEP 2025 (CERN)** Geneve, Switzerland  
"Precise Quantum Angle Generator Designed for Noisy Quantum Devices" Jan. 2025
- **Talk @ The Helmholtz "Matter and the Universe" Days 2024 (DESY)** Hamburg, Germany  
"Quantum Group @ DESY: Quantum Machine Learning for Calorimeter Simulation" Dec. 2024
- **Poster presentation @ QTech 2024 (Freie Universität Berlin)** Berlin, Germany  
"Precise Quantum Angle Generator Designed for Noisy Quantum Devices" Sep. 2024
- **Poster presentation @ IFAC 2023 (University of Catania)** Catania, Italy  
"Quantum Machine Learning for data analysis at LHCb" Apr. 2023
- **Poster presentation @ QIP 2023 (Ghent University)** Ghent, Belgium  
"Quantum phase detection generalization from marginal quantum neural network models" Feb. 2023

## PUBLICATIONS

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- 2024** Exploring the Phase Diagram of the quantum one-dimensional ANNNI model  
M. Cea, M. Grossi, **S. Monaco**, E. Rico, L. Tagliacozzo, S. Vallecorsa  
*arXiv pre-print*
- 2023** Quantum phase detection generalization from marginal quantum neural network models  
**S. Monaco**, O. Kiss, A. Mandarino, S. Vallecorsa, M. Grossi  
*Phys. Rev. B* 107 (8) p. L081105. American Physical Society
- 2023** Study of quantum correlations in LHCb simulated heavy flavour jets  
**S. Monaco**, D. Lucchesi, D. Zuliani, L. Sestini  
*thesis.unipd.it*