Alessandro Candido

Physicist, PhD

My PhD has been in the field of perturbative Quantum Chromodynamics (pQCD), focused on extracting the proton and nuclear structure from several accelerators data (integrating data set ranging from SLAC to LHC), by usage of a dedicated methodology developed by the collaboration I have been part of, based on neural networks, and modern machine learning techniques. After that, my interest shifted towards the field of quantum computing, getting involved as a core developer of Qibo, a full-stack quantum framework, with its own algorithmic language, simulation and hardware execution capabilities (currently tailored for superconducting qubits). Qibo is developed by an international collaboration, and aiming to support more and more academic laboratories by providing a flexible middleware platform.

Geneva, Switzerland

candido.ale@gmail.com

AleCandido (GitHub)

Alessandro Candido (LinkedIn)

candidoale (Telegram)

Work

CERN theory department

Research fellow

Oct 2023 – Present

INFN - sezione di Milano

Assegnista di ricerca (postdoc)

Apr 2023 – Oct 2023

Volunteer

University of Milan

Tutor

Oct 2021 – Jun 2022

Remote tutoring for math debt recovery, I year STEM students

- Remote teaching
- Exams preparation
- Exams review

Department of Physics, University of Milan

Teacher

Sep 2021 – Sep 2021

One week introductory course in analysis for I year students

- Review of functions, derivatives, integrals, and vectors
- Lectures website building
- Lecture notes writing

Department of Physics, University of Milan

Teaching Assistant & Tutor

Oct 2020 – Mar 2021

Teaching Assistant for the Quantum Mechanic 2 class of III year students

- Remote lectures, Google Groups community, having taught myself to exercise sessions

Department of Physics, University of Milan

Teaching Assistant

Mar 2020 – Oct 2020

Teaching Assistant for the Quantum Mechanic 1 class of II year students

- Among the first remote courses of the pandemic era: Zoom lectures and community management through Google Groups

Education

Università degli Studi di milano

Physics

Oct 2019 – Jan 2023

PhD

Scuola Normale Superiore

Physics

Sep 2014 – Jul 2020

Diploma di Licenza

University of Pisa

Theoretical Physics

Sep 2017 – Oct 2019

Master

University of Pisa

Physics

Sep 2014 – Jun 2017

Bachelor

Projects

Qibocal

Developer at **CERN**
Jan 2023 – Present
quantum computing

Quantum calibration, characterization and validation module. It encodes the routines required to calibrate a superconducting chip, together with a wider infrastructure for combining them into automated calibration procedures.

Qibolab

Developer at **CERN**
Jan 2023 – Present
quantum computing

Abstract the hardware specific details, providing a higher level interface to run circuits and pulse sequences on heterogeneous qubit platforms.

Qibo

Developer at **CERN**
Jan 2023 – Present
quantum computing

An open-source full stack API for quantum simulation and quantum hardware control.

Pineline

Designer and Developer at **University of Milan**
Jan 2021 – Dec 2023
high energy physics

Streamline the computation of theory predictions required for PDF fitting, creating a modular framework that allows integration of diverse providers.

PineAPPL - PineAPPL is not an extension of APPL

Developer at **University of Milan**
Jan 2021 – Dec 2023
high energy physics

Define and manage a predictions storage format (interpolation grids), suitable for the output of many Monte Carlo generators.

Yadism - Yet Another DIS Module

Designer and Developer at **University of Milan**
Nov 2019 – Dec 2023
high energy physics

Compute Deep Inelastic Scattering (DIS) predictions for a wide variety of observables and settings, providing predictions for a large set of experiments.

EKO - Evolutionary Kernel Operators

Designer and Developer at **University of Milan**
Nov 2019 – Dec 2023
high energy physics

Precompute DGLAP evolution kernel operators for fast and reusable predictions.

CDT2D - gauge fields

Designer and Developer at **University of Pisa, Scuola Normale Superiore**
Dec 2018 – Oct 2019
physics simulation

Quantum Gravity simulations in CDT framework

HPC | Lattice simulation | Monte Carlo | C++ | Python | Cluster

Publications

iNSPIRE

Published by **list**

ORCiD

Published by **list**

Google Scholar

Published by **list**

Skills

Python

Packaging | Testing | Data Analysis | Plotting | Compiled extensions | JIT

Quantum Computing

Simulation | Control | Calibration | Superconducting

Linux

OS | Shell | Configuration/Automation

Web Development

HTML | CSS | Javascript | Typescript | Svelte | SvelteKit | React

Rust

Data | CLI | async

Machine Learning

Tensorflow | JAX | Scikit-learn

Languages

Italian

Native speaker

English

Proficient user

References

> https://pcforte.mi.infn.it/
>
> — Stefano Forte

> https://www.df.unipi.it/en/people/delia-massimo/
>
> — Massimo D'Elia