ROBERTO FLÓREZ ABLAN

M.Sc Physics student

@ rflorezablan@gmail.com 49 176 58705367 https://github.com/rupof/
in Roberto Flórez

I am a M.Sc Physics student at the University of Stuttgart, member of the International Max Planck Research School (IMPRS) for Condensed Matter Science. I am currently working at the intersection between Quantum Computing (Numerical/Theory) and Machine Learning (Kernel Methods).

EDUCATION

M.Sc in Physics
(current) Grade: 1.1

University of Stuttgart and
Max Planck Research School for Condensed Matter Science

09/2022 - EXP 09/2024 Stuttgart, Germany

Microcertificate in Artificial Intelligence

University of Stuttgart Artificial Intelligence Software Academy (AISA)

06/2023 - EXP 06/2024 Stuttgart, Germany

B.Sc in Physics
Grade: 82.2%, final class rank: **2nd best out of 26 students.**

Federal University of São Carlos (UFSCar)

02/2018 - 04/2022 São Carlos, SP, Brazil

EXPERIENCE

Master's Thesis Research and Student Research Assistant

Fraunhofer IPA - Quantum Computing group

08/2023 - current Stuttgart, Germany

- Numeric simulations of Quantum Machine Learning Algorithms. Research on Quantum Kernel Methods and Applications to differential equations.
  Research advisor: Dr. Jan Schnabel, group of Dr. Marco Roth.

Academic research project in Large Language Models

Institute For Theoretical Physics III

09/2023 - 02/2024 Stuttgart, Germany

- Deep Learning research project: Implemented a Transformer Network (LLM) to learn the probability distributions from the Schrödinger's equation for a free gaussian particle. (See poster)
  Research advisor: Prof. Dr. Mathias Scheurer.

Undergraduate research project, scholarship by FAPESP

UFSCar - Light-atom group

08/2021 - 10/2022 São Carlos, SP, Brazil

- High performance computing numeric simulations (Python - QuTiP) of quantum optics and atomic physics. Research on *dipole-dipole contributions to biphoton emissions of four-wave-mixing (FWM) processes*.
  Research advisor: Prof. Dr. Romain Bachelard.

Undergraduate research project, scholarship by CNPQ

UFSCar - Opto-electronics and magneto-optics group (GOMA)

07/2020 - 10/2021 São Carlos, SP, Brazil

- van der Waals Heteroestructures: experimental setup of an optical characterization experiment for two-dimensional materials and some optical characterizations. **Research advisor: Prof. Dr. Yara Galvão Gobato**.

RELEVANT COURSES

Master level:
- Quantum Computing I and II
- Atomic Physics I and II
- Advanced Quantum Mechanics
- Condensed Matter Theory
- Machine Learning

Bachelor level:
- Quantum Mechanics 1 and 2
- Introduction to Quantum Computing
- Statistical Mechanics
- Computational Physics 1 and 2

AWARDS

- **Scholarship recipient** (2023-2024) of the Deutschlandstipendium. Merit scholarship "for international top-class talent" .
- **Scholarship recipient** (2022-2024) of the International Max Planck Research School (IMPRS) for Condensed Matter Science - **Fellowship program for highly qualified master students**.
- **Poster presented** at the EOSBF 2022, the largest topical meeting of the Brazilian Physical Society. Titled: *Collective effects in biphoton generation of a FWM process.*
- **Presentation done** at UFSCar Scientific Initiation Congress 2022. Titled: *Optical properties of two-dimensional semiconductor materials.*
- **Merit Scholarship 2020/1 and 2020/2**-scholarship granted to foreign students of **academic excellence** who are part of the cultural agreement PEC-G.
- Selected by cultural agreement PEC-G (2018) to pursue undergraduate studies in Brazil.

LANGUAGES

Spanish (Native)
Portuguese (Fluent)
English (Fluent)
German (B1)