CRISTIAN EMILIANO GODINEZ

Master student in Quantum Science and Technology at Technische Universität München
Strong coding and problem-solving skills, with expertise in Python.
Passionate about quantum computing, quantum simulations and scientific programming

CONTACT

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Cristian Emiliano Godinez

SKILLS

Programming

Python
Matlab
C#

Software & Tools

Quantum Computing (Qiskit, Pennylane, CirQ, & QuTip)
LaTeX
Visualisation (e.g. matplotlib)
Data handling/analysis (e.g. numpy, scipy, pandas)
Web Development (e.g Flask, CSS, HTML, SQL, ...)
Git

Operating Systems

MacOS
Windows
Linux

Languages

English
Spanish
German

CERTIFICATES

- Unitary Hack 2023 Open Source Developer - PennyLane and Qutip
- IBM Certified Associate Developer - Quantum Computation using Qiskit v0.2X
- Xanadu Pennylane Code-camp certificate: Pioneer Badge
- IBM Quantum Challenge Fall 2022 Achievement - Advanced
- IBM Qiskit Global Summer School 2022 - Quantum Excellence

EDUCATION

Master of Science in Quantum Science and Technology

TUM and LMU, München
10/2021 to date

- Focus areas: Quantum Computing, Open-Quantum Systems, Tensor Networks, Quantum Software Stack and Applications

Bachelor of Science in Physics

minor in Electrical Engineering **GPA: 1.2 (Best: 1.0)**

Jacobs University, Bremen
08/2018 - 06/2021

- Focus areas: Computational Physics, Financial Mathematics, Information Theory, and Open Quantum Systems.
- Thesis: "Generating Structured Thermal Noise for Quantum Dynamical Systems"
- Recipient of Jacobs University Merit Based Scholarship
- Member of the President's List at Jacobs University (top 10% of graduating class)

WORK HISTORY

Quantum Engineer in hardware characterization and simulations

12/2022 to date
IQM
Munich, Germany

- Simulating noisy quantum circuits with tensor networks for error mitigation.
- Developing new features for the IQM python-based pulse-level simulator.
- Exploring speed ups of open quantum system dynamics through parallelization techniques.

Working student in Quantum Computing

09/2022-12/2022
QAR labs
Munich, Germany

- Developing software and application-oriented prototypes for quantum optimization problems and quantum-based artificial intelligence
- Employing and contributing to expand open-source quantum computing libaries, such as openQAOA

Research Assistant in Project Management for the Munich Quantum Valley

06/2022 - 09/2022
Walther Meissner Institute
Garching by Munich, Germany

- Assisting in the management and preparation of events with external stakeholders. Creating communication documents for internal and external use.

Front-end developer for Archive Research Project

11/2021 - 06/2022
Technische Universität München
Munich, Germany

- Employing Python and Flask framework together with Bootstrap to create a dynamic web page including search, downloading and uploading functionalities.
- Archive website will be used by students and faculty at the university to upload, search and review academic documents, including thesis.

Teaching Assistant:

Information Theory, Electrodynamics, Intro to Electrical Engineering

02/2020 - 06/2021
Jacobs University, Bremen, Germany

- Mentored students from Computer Science and Electrical Engineering on topics from coding and error control schemes, multi-user communication, basics of cryptography, and data compression algorithms.
- Providing assistance in the preparation of physics students on topics from Electrodynamics, e.g. Maxwell's equations, fields in matter, special relativity and optics.

AWARDS

- First place in *QHack 2023 by PennyLane* project on "*Accelerating Noisy Algorithm Research with PennyLane-Lightning and NVIDIA cuQuantum SDK*" in Nvidia category. [1] 03/2023
- Top 10 teams at *Quantum Coding-Camp 2022 by PennyLane* 11/2022
- Bronze medal in *The University Physics Competition* for paper on "*Magnetic Protection to Travelers against Space Radiation using Superconductors*" [2] 01/2020
- Nominated as one of the Physics-program representatives for accreditation process 12/2019
- Silver medal in *The University Physics Competition* for paper on "*Sending a Light Sail Propelled Nanocraft to Alpha Centauri*" [3] 01/2019
- Bronze medal in *Iberoamerican Physics Competition* [4] 09/2017

EXTRACURRICULAR

- **Physics Society President**: Organizing weekly meetings and physics-related activities, including talks, guided tours, seminars and social events
  09/2019 - 05/2021
- **Organizer of Women in International Leadership Conference**: Developing conference website, including newsletter, registration procedures and forms, handling donation interface, and providing maintenance. [5]
  10/2020 - 05/2021

PROJECTS

Co-author of "An Affordable Gradient Mixer for Chromatography with Aqueous and Organic Solvents"

Analytical Chemistry eJournal — published on 09/2022

- Co-authoring, producing and developing a gradient used for mixing aqueous solvents using micro-controllers, RF control units and 3D printing. Developing the code on the micro-controller. Implemented to help automating processes carried out at the laboratory by the chemistry research groups of Jacobs University.

  Publication:
  https://www.sciencedirect.com/science/article/abs/pii/S0021967323001565

Member of the Quantum Entrepreneurship Laboratory

TUM Venture Labs & PushQuantum — 10/2021 - 03/2022

- Project-based course bringing together students of different backgrounds with reputable industry partners and selected quantum specialists to explore new commercial applications of quantum computing. Learning how to derive use cases for Quantum Computing, how to validate our idea and how to build & present a first prototype of our Quantum Computing software solution.

Preparation of paper on Spectral density of LHC II & Population Dynamics using NISE and HEOM

06/2021 - 10/2021

- Working along Prof.Dr.Ulrich Kleinekathöfer, expanding the work done on my bachelor's thesis, performing tests on more general systems to recreate the spectral density of a Light Harvesting Complex System II (LHC II). Using NISE and HEOM approaches for the generation of population dynamics of processes following complex spectral densities.

Research Assistant of Computational Physics group

Jacobs University — 08/2020 - 08-2021

- Implementing and developing computational methods for the study of Quantum dynamical systems such as light harvesting complexes. Focusing on applications using high-level programming languages like Python and Matlab through scientific and numerical analysis libraries, e.g. SciPy, NumPy, and MPmath.
- Further thermal corrections done using machine learning libraries such as Pytorch.

MINT Workshop in Physics

01/2021

- Preparing and teaching a one-week physics workshop addressed to high school students from Northern Germany via online platform. Topics on particle-wave duality and their applications in current research, including a brief introduction to programming basics in Python.

  Event page (German):https://www.jacobs-university.de/minternational.

Co-Creator of "Fisica Olimpica en Guatemala"

Summer 2019

- Blog aiming to help students lacking experience and guidance, providing them with a program they can follow to prepare themselves to participate in international physics competitions at different levels. Resources and tutorials obtained from personal experience and past competitions. Currently used for Guatemalan students.

  See blog at: https://fisicaolimpicaguatemala.blogspot.com.

[1] See summary at: https://pennylane.ai/blog/2023/04/qhack-2023-highlights/#open-hackathon
[2] See results at: http://www.uphysicsc.com/2019contest.html
[3] See results at: http://www.uphysicsc.com/2018contest.html
[4] See results at: http://oc.uan.edu.co/oibf2017/pruebas-y-resultados
[5] Women in International Leadership web page: https://www.conference-wil.com