Juan Fernández de la Garza

juanfernandezdlg@gmail.com ◇ linkedin.com/in/fernandezdlg
github.com/fernandezdlg ◇ juanfernandez.org

ACADEMIC SUMMARY

MSc Physics – ETH Zürich (GPA: 5.55/6.0, cohort's mean: 5.42)	09/2021 - 06/2023
BSc Engineering Physics, Honors – Tecnológico de Monterrey (GPA: 98/100, 2nd highest in my cohort)	08/2016 - 06/2021
+ Exchange studies at NTU in Singapore & EPFL in Switzerland.	01/2019 - 08/2020

WORK HISTORY

Data Engineer at ClimateAI 12/2023 - 06/2024

⋆ Reduced processing time on ML model tests by ~20x by developing a data rechunking module.
⋆ Designed two data QA systems for anomalous weather forecast detection. Implemented one for global-wide assessment.
⋆ Engineered a module for NaN-free weather data and implemented automatic end-to-end checks with it across our DAGs.
⋆ Contributed strongly towards better unit test coverage throughout our code base.
⋆ Mainly worked with the XArray, Zarr, Dask, Pandas and Numpy libraries in Python, and AWS Cloud.

Teaching Assistant at ETH Zürich 02/2022 - 12/2022

⋆ For "Electrodynamics" (undergraduate level) and "Quantum Information Theory" (master's level).

Teaching Assistant at Tecnológico de Monterrey 08/2018 - 12/2020

⋆ For "Theory of Electromagnetism", "Electricity and Magnetism" and "Physics I".

RECENT PROJECTS

Simulations of Lattice Gauge Theories with GPUs – *ETH Zürich*

➤ Visiting student 10/2023 - 11/2023
   ⋆ Worked on adding support of GPU-CPU unified memory for the QUDA-OpenQxD interface.

➤ Master's thesis student (graded "very good" 5.5/6.0) 09/2022 - 04/2023
   ⋆ Worked on the first QUDA-OpenQ*D API for GPU offloading, written in CUDA C++.
   ⋆ Benchmarked the reduction operator of a lattice plaquette field using GPU and CPU parallelization schemes and analyzed their weak scaling.

Quantum Information: From Foundations to Algorithms (Master's proseminar) – *ETH Zürich* 02/2022 - 06/2022

⋆ Delivered a seminar on quantum simulations of lattice gauge theories. <slides> <report>

Partially Coherent Light with Machine Learning DOI:10.1117/12.2596626 – *Tecnológico de Monterrey* 08/2020 - 06/2021

⋆ Performed decompositions of Ince-Gaussian beams by training a CNN using Tensorflow.
⋆ Simulated light decoherence with a Monte Carlo method in MATLAB.

Legendre-Lorentzian Solitons DOI:10.1088/2040-8986/abf026 – *Tecnológico de Monterrey* 08/2020 - 04/2021

⋆ Derived a new family of soliton solutions in (1+1) dimensions and characterized their stability.

PROGRAMMING EXPERIENCE

Extensive:	Python (4+ yrs.)	◇	LaTeX (5+ yrs.)	◇	MATLAB (3+ yrs.)
Intermediate:	C/C++ (1+ yrs.) ◇ Git (1+ yrs.)	◇	GNU/Linux (2+ yrs.)	◇	Mathematica (1+ yrs.)
Basic:	GNU Make ◇ CUDA ◇ Tensorflow ◇ Pytorch ◇ Pandas ◇ Qiskit ◇ QuTiP				

LANGUAGE SKILLS

Spanish: Native ◇ **English**: C1 (TOEFL iBT 113/120) ◇ **German**: B1/B2 ◇ **French**: B1

EXTRACURRICULAR ACTIVITIES

Student government at Tecnológico de Monterrey

• Director of Finance for the XXII International Physics Symposium (SIF).	07/2020 - 03/2021
• Olympiad Mathematics Coordinator for in-campus social service (JaqueMat).	07/2018 - 12/2018
• Fundraising Coordinator at the Engineering Physics Student Society (SAIFI).	01/2018 - 05/2018

AWARDS AND SCHOLARSHIPS

Fulbright-García Robles Scholarship *(declined)*	Received in 07/2022
PLANCKS Physics Competition 2021: 10th place worldwide to "Hijos de Galois" team	Received in 07/2021
SPIE Optics and Photonics Education Scholarship	Received in 05/2021
Mexican Physics Tournament 2021: 2th place nationwide to "Hijos de Galois" team	Received in 02/2021
iGEM 2018 Silver Medal to Tec-Monterrey team	Received in 10/2018
Alma Máter Award to the Engineering Physics Student Society 2017-2018	Received in 04/2018
Tecnológico de Monterrey Scholarship for Academic Talent	Received in 06/2016
Tecnológico de Monterrey International Science Competition 2016: 1st place in Mathematics	Received in 02/2016

WORKSHOPS AND CONFERENCES

Methods of Effective Field Theory and Lattice Field Theory @ Bad Honnef Physics School	07/2023
Zurich Undergraduate Colloquium in Computational Science, Mathematics and Physics @ ETH Zürich ↪ Delivered an introductory talk on simulating quantum physics with computers. <slides> <video>	04/2023
Efficient simulations on GPU hardware @ ETH Zürich	10/2022
SPIE: Laser Beam Shaping XXI ↪ Presented my research project on the decomposition of Ince-Gaussian beams with a neural network.	08/2021
Gulf Coast Undergraduate Research Symposium @ Rice University ↪ Presented preliminary results of my research project on Legendre-Lorentzian solitons. <slides>	10/2020
XV School of Fundamental Physics @ Autonomous University of Querétaro	08/2020
iGEM Giant Jamboree 2018 ↪ Presented the mathematical model and results of our CRISPR-Cas project. <slides>	10/2018
MIT–Tecnológico de Monterrey "NanoLAB" on micro– and nanofabrication techniques	Summer 2018