Pablo Castaño Basurto

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28 Nov 2003

Research Interests

- Standard Model Physics
- Neutrino Flavor Oscillations
- Quantum Field Theory and Relativistic Quantum Field Theory
- Elementary Particle Interactions
- Quantum Computing & Programming

Education

B.S. Physics, B.S. Pure Mathematics
University of California, Berkeley
Jun 2020 – present | Berkeley, CA
- 3.590 GPA, International Student

High School Diploma
St. George's School
Aug 2018 – Jun 2020 | Bilbao, Spain
- 4.0 GPA, Valedictorian

High School Diploma
Gresham's School
Aug 2017 – Jun 2018 | Holt, UK
- 4.0 GPA, Mathematics IGCSE (9), Physics IGCSE (8).

Awards

The Leadership Award
UC Berkeley CAA Alumni

UK Mathematics Olympiad Gold Award
UK Mathematics Trust

Outreach/Events

SciArt Conference
An event by Neil DeGrasse Tyson on STEM Courses and their relationship to more creative disciplines.

QWorld Mexico
A week-long quantum computing workshop and set of lectures for college students.

Languages

English
C2, 110 TOEFL, Fluent

French
B2-C1, 7 years in High School

Spanish
Native Speaker

German
A2 Level, 2.5 years of learning

Research Experience

Neutrino Physics
Mentee to Dr. Carlos Argüelles-Delgado and Member of the Harvard IceCube Group
Oct 2020 – present | Boston, US

Working and collaborating on projects including:
- New Insights in Neutrino Oscillation Simulations on a Quantum Processor with Error Minimizations
- Graph Neural Networks and Machine Learning to optimise Neutrino Detection and Identification at IceCube

Publication in preparation (Co-author, anticipated publication in APS)

Computational Standard Model Physics
Mentee at the Undergraduate Laboratory at Berkeley
Aug 2020 – present | Berkeley, US

Working with a group of Berkeley undergraduates to understand and model elementary particle interactions and their respective Feynman diagrams using CERN's software ROOT and C++.

ADD HERE THE URAP RESEARCH IF I GET ADMITTED

Technical Skills

Python
Developed my Python skills and applied them to research scenarios using Jupyter Notebooks to create out MonteCarlo Simulations, Interactive Models, and to understand the Neutrino Detections at the IceCube Laboratory.

Qiskit/Quantum Programming
Worked with the Python Qiskit library to create Quantum Circuits that I later ran on the IBM Quantum Computer. Trained my skills at the online workshop World Mexico.

C++/ROOT
Learnt C++ and ROOT from Deepak Kar's textbook "Experimental Particle Physics: Understanding the measurements and searches at the LHC " to simulate elementary particle interactions.

Talks

American Physical Society (APS) April Meeting
Approved abstract, Scheduled for April 2021
I will deliver a talk on Neutrino Oscillations in the APS April 2021 meeting.

Conference/Colloquia Attendance

WIPAC IceCube Symposia
Oct 2020 – Dec 2020 | Series of Particle Physics Lectures by IceCube

String Theory, Quantum Mechanics, and Gravity
Nov 2020 | Leonard Susskind, Harvard Colloquium

Particle Physics Meets Machine Learning
Nov 2020 | MIT Professor Jesse Thaler

The Large Neutrino Collider
Nov 2020 | CERN TH Colloquium on Neutrino Physics, Pedro Machado

Neutrino Oscillations: Where We Are, Where We're Going
Nov 2020 | Dr. Kevin Kelly, Fermilab Symposium