Alex Preciado

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SKILLS

Quantum Software Development Manager with 8+ years of experience in developing predictive models, data infrastructure, and software for industry and international scientific collaborations. Core developer of the software used to model the first image of a black hole obtained by the EHT Collaboration. Currently leading the Core team developing PennyLane, Xanadu's open-source library for quantum computing and quantum machine learning. Also serving as an AI and Data Analytics Instructor at Schulich School of Business, York University.

- **Programming Languages:** Python, C++, shell scripting, prior experience with Fortran.
- **Data Infrastructure.** Proficient in AWS, GitHub, Databricks, Docker, Airflow, Tableau, Vault Enterprise.
- **Database Management:** MySQL, Postgres and Microsoft SQL servers. Cloudera Impala Data Warehouses.
- **High Performance Computing.** 2.5 years of experience developing parallelized software for HPC systems.
- **Teaching:** Expertise in delivering engaging content and designing course materials for AI & data analytics courses.

EXPERIENCE

Manager, Quantum Software Development   June 2023 – Present
Xanadu Quantum Technologies Inc.
- Lead the Core and High-Performance Computing teams in developing PennyLane, our cutting-edge Python library for quantum machine learning and quantum computing.
- Coordinate the development of CPU and GPU-based backends to simulate quantum hardware.
- Oversee the software development lifecycle for PennyLane.
- Facilitating team processes (iteration planning, technical roadmap definition, code discussions, bug tracking, and successful product delivery).
- Responsible for end-to-end people management.

Manager, Machine Learning & Data Engineering   Aug 2021 – May 2023
HelloFresh Canada
- Led a team of 4 data engineers to support strategic partners across various business functions, including Demand Planning, Procurement, Production, Marketing, Product, Finance, HR.
- Coordinated the development of data products and data ingestion pipelines to support decision making and automation of business-critical processes.
- Managed the development of software solutions for demand planning, production scheduling and inventory management for the new ready-to-eat/ready-to-heat brand in Canada (Factor).
- Led the onboarding and implementation of new data infrastructure for the Canadian Data Team (AWS, Databricks, Airflow, Presto, Vault Enterprise, etc.).
- Managed Operational Databases to store Menu, Recipe, Supplier, Ingredient, QA & Inventory data.

Data Scientist   Aug 2019 – July 2021
HelloFresh Canada
- Developed Market Share models and conducted Competitor Analysis using third party (credit card and website traffic) data for local and global leadership and Investors Relations teams.
- Customer 360. Led the creation of customer-level datasets for RFM analyses, customer segmentation, and Machine Learning models to identify high/mid/low-value customers.
- Built demand forecasting models to support aggressive add-on offer expansion during COVID-19 pandemic.
- Contributed to working groups on Data Literacy, Data Governance & Data Infrastructure. Served as Data Literacy coordinator to develop up-skilling frameworks & organize international Data Literacy campaigns.

Postdoctoral Researcher   Nov 2016 – Jan 2019
Perimeter Institute for Theoretical Physics (Waterloo, ON)
- Led the development of the official parameter estimation library for the Event Horizon Telescope (EHT) Collaboration, enabling the analysis of astrophysical data that resulted in the first image of a black hole.
- Devised and implemented parameterized models to estimate black hole parameters.
- Validated and tested analytical & numerical models using High-Performance Computing (HPC) systems.

TEACHING EXPERIENCE

Part-time Instructor   Sep 2022 – Present
Schulich School of Business, York University
- Instructing AI and Data Analytics courses in the Master of Management in Artificial Intelligence (MMAI) and Master of Business Analytics (MBAN) programs.
- Courses taught: Database Fundamentals

Physics Instructor   Apr 2011 – June 2013
Colegio Británico, Mexico
- Developed and delivered curriculum for High School Physics Courses
- Courses taught: Physics I & II, Selected Topic in Physics I & II

English Teacher   Dec 2004 – June 2008
Harmon Hall, Mexico
- Developed and delivered curriculum for English language Courses
- Courses taught: Various Basic, Intermediate and Advanced English courses

EDUCATION

PhD, Physics	University of Guanajuato (Mexico)	2010 - 2015
Masters, Physics	University of Guanajuato (Mexico)	2008 - 2010
B. Eng., Electrical Engineering	University of Guanajuato (Mexico)	2002 - 2008

AWARDS & ACHIEVEMENTS

- **Albert Einstein Medal** for the first image of a supermassive black hole (May 2020).
- **2020 Breakthrough Prize in Fundamental Physics** for the 1st image of a supermassive black hole (Nov 2019).
- **Diamond Achievement Award of the National Science Foundation**, presented to the team that captured the first-ever image of a black hole (May 2019).
- **Bronze Medal**, VII Ibero-American Physics Olympiad (2002).
- **Gold Medal,** XII National Physics Olympiad (Mexico, 2001).

MAIN PUBLICATIONS

Quantum Cosmology and Alternative Gravity Theories:
- Well-posed Cauchy formulation for Einstein-æther theory, *Classical and Quantum Gravity,* 36 (2019), No. 16.
- Quantum cosmology in Hořava-Lifshitz gravity, Phys Rev. D 86, 063502 (2012).
- A quantum cosmological model in Hořava-Lifshitz gravity, AIP Conference Proceedings 1396, 151 (2011).

Publications with the Event Horizon Telescope (EHT) Collaboration:
- THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope, *ApJ Letters*, 897 (2020) 139.
- Spacetime Tomography Using the Event Horizon Telescope, *ApJ Letters*, 892 (2020) 132.
- The EHT General Relativistic Magnetohydrodynamic Code Comparison Project, *ApJS*, 243 (2019) 26.
- EHT observations of the jet launching and collimation in Centaurus A, *Nature Astronomy*, 5 (2021) 1017-1028.

First Sgr A* EHT Results (The First Image of the Black Hole in the Center of our Galaxy):
- I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way, *ApJ Letters*, 930 (2022) L12.
- II. EHT and Multiwavelength Observations, Data Processing, and Calibration, *ApJ Letters*, 930 (2022) L13.
- III. Imaging of the Galactic Center Supermassive Black Hole, *ApJ Letters*, 930 (2022) L14.
- IV. Variability, Morphology, and Black Hole Mass, *ApJ Letters*, 930 (2022) L15.
- V. Testing Astrophysical Models of the Galactic Center Black Hole, *ApJ Letters*, 930 (2022) L16.
- VI. Testing the Black Hole Metric, *ApJ Letters*, 930 (2022) L17.

First M87 EHT Results (The First Image of the Black Hole in the Center of the M87 Galaxy):
- [I. The Shadow of the Supermassive Black Hole](), *ApJ Letters,* 875 (2019) L1.
- [II. Array and Instrumentation](), *ApJ Letters,* 875 (2019) L2.
- [III. Data Processing and Calibration](), *ApJ Letters,* 875 (2019) L3.
- [IV. Imaging the Central Supermassive Black Hole](), *ApJ Letters,* 875 (2019) L4.
- [V. Physical Origin of the Asymmetric Ring](), *ApJ Letters,* 875 (2019) L5.
- [VI. The Shadow and Mass of the Central Black Hole](), *ApJ Letters*, 875 (2019) L6.
- [VII. Polarization of the Ring](), *ApJ Letters,* 910 (2021) L12.
- [VIII. Magnetic Field Structure near The Event Horizon](), *ApJ Letters,* 910 (2021) L13.
- [X. Detection of Near-horizon Circular Polarization](), *ApJ Letters, 957 (2023) L20*

Note: A full List of publications can be found in INSPIRE ([here]()) and Google Scholar ([here]()).