Alex Preciado

linkedin.com/in/alexpreciado

SKILLS

Quantum Software Development Manager with 7+ years of experience developing predictive models, data infrastructure, and software for industry and global scientific collaborations. Core developer of the software used to model the first image of a black hole obtained by the Event Horizon Telescope Collaboration, and current leader of the Core & High-Performance Computing squads 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.** Python, C++, shell scripting. Previous experience with Fortran
- **Data Infrastructure.** AWS, GitHub, Databricks, Docker, Airflow, Tableau, Vault Enterprise.
- **Database Management.** MySQL and Postgres databases. Cloudera Impala Data Warehouses.
- **High Performance Computing.** 2.5 years of experience developing parallelized software for HPC systems.

EXPERIENCE

Manager, Quantum Software Development June 2023 – Present
Xanadu Quantum Technologies Inc.

- Lead the Core and High-Performance Computing squads in developing PennyLane, our cutting-edge 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 5 data engineers supporting strategic partners across all business functions (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 for demand planning, production scheduling and inventory management for a 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 local Operational Databases (Menu, Recipe, Supplier, Ingredient, QA & Inventory data).

Data Scientist Aug 2019 – July 2021
HelloFresh Canada

- Developed Market Share models and conducted Competitor Analysis using 3rd party (credit card and website traffic) data for local and global SLT, and Investors Relations teams.
- Customer 360. Led the creation of customer-level datasets used for RFM analyses, customer segmentation, and Machine Learning models to identify high/mid/low-value customers.
- Demand forecasting models to support aggressive add-on offer expansion during COVID-19 pandemic.
- Member of the Data Literacy, Data Governance & Data Infrastructure working groups. Local Data Literacy Program coordinator (Developed local/global up-skilling frameworks) & Data Literacy Campaign organizer.

Postdoctoral Researcher Nov 2016 – Jan 2019
Perimeter Institute & Event Horizon Telescope (EHT) Collaboration

- Led the development of a parameter estimation library for analyzing astrophysical data.
- Devised and coded parametrized models to estimate black hole parameters.
- Validated and tested analytical/numerical models using High-Performance Computing (HPC) systems.
- Successfully contributed to capturing the first-ever image of a black hole with a global team of researchers.

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 of researchers who captured the first-ever image of a black hole (May 2019).
- **Bronze Medal**, VII Ibero-American Physics Olympiads (2002).
- **Gold Medal,** XII National Physics Olympiads (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.

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).