**Alex Preciado**

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|  | linkedin.com/in/alexpreciado |  | github.com/alex-preciado |

**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](https://www.nytimes.com/2019/04/10/science/black-hole-picture.html) obtained by the EHT Collaboration. Currently leading the Core team developing [PennyLane](https://pennylane.ai/), 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**

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| **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. | |
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| **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. | |
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| **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. | |
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| **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. | |
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**TEACHING EXPERIENCE**

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| **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 | |
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| **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 | |
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| **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**

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| **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](https://arxiv.org/abs/1902.05130),  *Classical and Quantum Gravity,* 36 (2019), No. 16.
* [Quantum cosmology in Hořava-Lifshitz gravity](https://journals.aps.org/prd/abstract/10.1103/PhysRevD.86.063502), Phys Rev. D 86, 063502 (2012).
* [A quantum cosmological model in Hořava‐Lifshitz gravity](https://aip.scitation.org/doi/abs/10.1063/1.3647539), AIP Conference Proceedings 1396, 151 (2011).

Publications with the Event Horizon Telescope (EHT) Collaboration:

* [THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope](https://iopscience.iop.org/article/10.3847/1538-4357/ab91a4), *ApJ Letters*, 897 (2020) 139.
* [Spacetime Tomography Using the Event Horizon Telescope](https://iopscience.iop.org/article/10.3847/1538-4357/ab744c), *ApJ Letters*, 892 (2020) 132.
* [The EHT General Relativistic Magnetohydrodynamic Code Comparison Project](https://iopscience.iop.org/article/10.3847/1538-4365/ab29fd), *ApJS*, 243 (2019) 26.
* [EHT observations of the jet launching and collimation in Centaurus A](https://www.nature.com/articles/s41550-021-01417-w), *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](https://iopscience.iop.org/article/10.3847/2041-8213/ac6674), *ApJ Letters*, 930 (2022) L12.
* [II. EHT and Multiwavelength Observations, Data Processing, and Calibration](https://iopscience.iop.org/article/10.3847/2041-8213/ac6675), *ApJ Letters*, 930 (2022) L13.
* [III. Imaging of the Galactic Center Supermassive Black Hole](https://iopscience.iop.org/article/10.3847/2041-8213/ac6429), *ApJ Letters*, 930 (2022) L14.
* [IV. Variability, Morphology, and Black Hole Mass](https://iopscience.iop.org/article/10.3847/2041-8213/ac6736), *ApJ Letters*, 930 (2022) L15.
* [V. Testing Astrophysical Models of the Galactic Center Black Hole](https://iopscience.iop.org/article/10.3847/2041-8213/ac6672), *ApJ Letters*, 930 (2022) L16.
* [VI. Testing the Black Hole Metric](https://iopscience.iop.org/article/10.3847/2041-8213/ac6756), *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](https://iopscience.iop.org/article/10.3847/2041-8213/ab0ec7), ApJ Letters, 875 (2019) L1.
* [II. Array and Instrumentation](https://iopscience.iop.org/article/10.3847/2041-8213/ab0c96), ApJ Letters, 875 (2019) L2.
* [III. Data Processing and Calibration](https://iopscience.iop.org/article/10.3847/2041-8213/ab0c57), ApJ Letters, 875 (2019) L3.
* [IV. Imaging the Central Supermassive Black Hole](https://iopscience.iop.org/article/10.3847/2041-8213/ab0e85), ApJ Letters, 875 (2019) L4.
* [V. Physical Origin of the Asymmetric Ring](https://iopscience.iop.org/article/10.3847/2041-8213/ab0f43), ApJ Letters, 875 (2019) L5.
* [VI. The Shadow and Mass of the Central Black Hole](https://iopscience.iop.org/article/10.3847/2041-8213/ab1141), *ApJ Letters*, 875 (2019) L6.
* [VII. Polarization of the Ring](https://iopscience.iop.org/article/10.3847/2041-8213/abe71d), *ApJ Letters*, 910 (2021) L12.
* [VIII. Magnetic Field Structure near The Event Horizon](https://iopscience.iop.org/article/10.3847/2041-8213/abe4de), *ApJ Letters*, 910 (2021) L13.
* [X. Detection of Near-horizon Circular Polarization](https://iopscience.iop.org/article/10.3847/2041-8213/acff6f)*, ApJ Letters, 957 (2023) L20*

**Note:** A full List of publications can be found in INSPIRE ([here](https://inspirehep.net/literature?q=a%20J.A.Preciado.1&ui-citation-summary=true&sort=mostrecent)) and Google Scholar ([here](https://scholar.google.ca/citations?user=ZIUyto0AAAAJ&hl=en)).