

Dr. Fernando Gutiérrez Canales

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Skills

Programming:

- **Advanced:** Python (NumPy, SciPy, Matplotlib, Conda, Venv, Scikit-Learn), C, Fortran,
- **Intermediate:** R, Version Control (Git and Subversion), bash, ssh
- **Beginner:** Parallel computing: OpenMP (used with Fortran and C)
- **Computational modeling:** PDEs, Large Data-bases, Time-series
- Data analysis, data visualization
- **Astrophysics:** Hydrodynamics, kinetic simulations, Bayesian statistics
- **Office applications:** Microsoft Office, Libre Office, L^AT_EX, Vim, nano

Languages

- **Spanish:** native
- **English:** professional
 - IELTS: C1
- **French:** good
- **German:** basic

Soft and interpersonal

- Team-work
- Planification
- Delegate
- Organization

Summary

PhD in Astrophysics with 5+ years of experience in data modeling, statistical analysis, and software development. Built scalable Python-based data pipelines for space mission analysis (PLATO, ESA). Skilled in working with large datasets, Bayesian modeling, and machine learning. Effective communicator with a strong record of collaboration in international research environments. Now seeking to apply these skills to data-driven roles in industry, including analytics, finance, or tech.

Research Experience & Education

March 2022 – March 2025

PhD — Paris Observatory and Max Planck Institute for Solar System Research

- Thesis topic: The PLATO space mission: Double-aperture photometry and Centroid Shifts to detect False Positives
 - Grade: **With honors**
- **Key result:** Developed, in the context of PLATO space mission, a **state-of-the-art numerical code** that estimates for the first time the overall efficiency of the centroid method to detect false planetary transit and also the overall efficiency a novel method called double-aperture photometry.
- The code is written in Python language, based on several libraries written in C and bash, and publicly available in a gitlab remote repository
- Participating in a huge multi-institution international consortium formed to develop the PLATO mission instrument and pipeline

2019 - 2021

Master's degree in Sciences: Astrophysics — University of Guanajuato, Mexico

- **GPA: 9.5/10**
- Thesis: Homogeneous Analysis of K2 exoplanet systems hosting USP planets
- **Key result:** Implemented and mastered the scientific code `pyaneti` for improving the mass and radii measurement of several exoplanets previously discovered by K2 space mission.

2014 – 2019

Bachelor's Degree in Physics — University of Guanajuato, Mexico

- **GPA: 9.0/10**
- **Undergraduate Research Assistant** in the group of Non-linear Optics of the University of Guanajuato — 01/2016 – 10/2019
- Thesis: Atomic theory and scientific realism
- Developed a scientific publication about the most important philosophical and physical ways to show that atoms exist.

Research intern — ESTEC (European Space Agency), The Netherlands — 2023

- Estimating Charge Transfer Inefficiency, CTI, parameters for PLATO detectors
- Conducted in-situ measurements with a real PLATO CCD detector
- Used **Python** and **DS9** to analyze multidimensional simulation data output

Conferences

- EAS (European Astronomical Union) — 2024
- PLATO Week # 15 Meeting — 2024
- PLATO Week # 14 Meeting — 2023
- Workshop *Journé des thèses* — 2022

Scholarships & Awards

- PhD obtained with Honors — 2025
- Erasmus+ scholarship for an internship at ESTEC, the largest European Space Agency (ESA) center in Europe — 2023
- Master's degree obtained with Honors — 2021
- Scholarship for studying a master's degree in Mexico with international competence — 2018
- Bachelor's degree obtained with Honors — 2019

Publications

- Interpretation of Optical and IR Light Curves for Transitional Disk Candidates in NGC 2264 Using the Extincted Stellar Radiation and the Emission of Optically Thin Dust Inside the Hole, 2021, E. Nagel, F. Gutiérrez-Canales, S. Morales-Gutiérrez and A. P. Sousa.
- The young HD 73583 (TOI-560) planetary system: Two 10-M_⊕ mini-Neptunes transiting a 500-Myr-old, bright, and active K dwarf, 2023, O. Barragán,..., F. Gutiérrez-Canales, ..., E. Nagel
- Detecting False Positives with PLATO using Double-Aperture Photometry and Centroid Shifts , F. Gutiérrez-Canales, R. Samadi A. Birch, , submitted in December 2024.