

Fernando Gutiérrez Canales

Dr. (Astrophysics) — Data Scientist

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Professional Summary

Data Scientist and Scientific Developer with a PhD in Astrophysics and 5+ years of experience building scalable data pipelines for frontier scientific research. My work focuses on creating robust software solutions and analytical tools to manage, process, and extract meaning from complex, multi-source datasets. I have a proven track record of successful collaboration within large international consortia, turning research needs into practical, maintainable software. I am eager to contribute my skills in data management and analysis to support the impactful, mission-driven research at the German Primate Center.

Work Experience

Paris Observatory & Max Planck Institute for Solar System Research Meudon and Göttingen
PhD researcher *Mar 2022 – Jul 2025*

- Developed robust Python-based simulation pipeline to estimate cutting-edge detection efficiency for planetary transit methods (centroid shifts and double-aperture photometry) in the PLATO space mission.
- Integrated C and Bash modules; published results as part of the PLATO international science consortium.
- Collaborated with over 15 institutions around the world in mission-critical software development and instrument calibration.

ESTEC (European Space Agency) **Noordwijk, The Netherlands**
Research Intern *June 2023 – August 2023*

- Conducted in-situ CCD measurements for PLATO detector calibration.
- Automated CTI parameter estimation using Python, improving calibration efficiency for ESA detectors

Personal Projects

Scientific & Technology Development Projects **León, Mexico**
Math & Science Teacher for at-risk high school students *2021-2022*

- Developed engaging data-driven lessons that increased student performance by 60 %
- Included pedagogical materials in my math and physics lessons, increasing the engagement and participation of the students

Digitalization & Data Analysis *2021-2022*

- Digitalized and structured patient records into a searchable database, improving management and accessibility for clinic staff.
- Engineered a Python tool utilizing Spotify's API to analyze listening habits, build a recommendation model, and generate personalized, data-driven playlists.

Skills & Interests

Hard Skills: Python (NumPy, SciPy, Pandas, Matplotlib, Scikit-learn, Astropy), C, Fortran, Bash, R, Shell scripting, Git, Subversion, Docker, Unix, Linux, Conda, Jupyter, DS9, SQL, Custom simulation pipelines, Machine Learning, Time-Series Analysis, Bayesian Inference, Monte Carlo Methods, Large

Datasets, LLM-based tools (in progress), AI-assisted analysis, Tableau, LaTeX, Microsoft Office, Libre-Office, Vim, nano, Web development: HTML, CSS

Soft Skills: Problem-Solving, Teamwork, Time Management, Adaptability, Curiosity, Self-Learning, Resilience, Analytical Thinking, Technical Communication, Project Management, Creativity and Innovation, Attention to Detail

Languages:

- Spanish (native)
- English (C1)
- French (B2)
- German (basic)

Interests: Astronomy, Arts, Poetry, Sports, Wellness.

Education

PhD in Astrophysics

Paris Observatory & MPS Göttingen

With Honors

- Thesis: The PLATO mission: Detecting False Positives using Double-aperture photometry and Centroid Shifts

MSc in Astrophysics

University of Guanajuato, Mexico

GPA: 9.5/10, With Honors (2021)

- Thesis: Homogeneous Analysis of K2 planetary systems hosting USP planets

BSc in Physics

University of Guanajuato, Mexico

GPA: 9.0/10, With Honors (2019)

Scientific Outreach Activities

Astronomía Divertida Group

Astronomy Department University of Guanajuato

Guanajuato, Mexico

2021-2022

- Participation and organization of astronomy talks in public spaces, including observations of the night sky at archeological sites
- Participation in astronomy outreach talks in the local TV channel of Guanajuato

IX REA (Mexican Astronomy Students Meeting)

Quintana Roo Planetarium

Cancún, Mexico (Hybrid)

Summer 2021

- Participated as a SOC member and a moderator for scientific talks at the IX REA

Research activities and awards

- Presented an electronic poster about my PhD work at the European Astronomical Society, EAS (2024), Padova.
- Presented a scientific talk about my PhD work at the PLATO Week #14, (2023), Prague.
- Presented a poster about my PhD work at Journée des Thèses (2022), Meudon.
- Co-author on peer-reviewed publications on planetary systems and photometric signal analysis
- Full Scholarships & Degrees with honors (2019, 2021, 2023, 2025)