

Oscar Andrés Flores Gaitán

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Education

- Licentiate in Physics** *Guatemala City*
Universidad del Valle de Guatemala Jan 2022 – present
- **Honors:** Cum Laude
 - **Current Coursework:** Statistical Mechanics, Quantum Mechanics II, Mathematical Methods for Physics II, Solid State and Photonics
 - **Expected Graduation:** November 2025
- German Intensive Course** *Aachen (Remote)*
Sprachenakademie Aachen Oct 2020 – May 2021
- Completed a 7-month, 525-hour German intensive course.
- International Baccalaureate (IB) Diploma / High School Diploma** *Guatemala City*
APDE El Roble Jan 2016 – Oct 2020
- **Honors:** Summa Cum Laude

Research Interests

Exoplanet detection and characterization, planet formation and evolution, application of machine learning and statistical methods to astronomical time-series and spectral data.

Research Experience

- Undergraduate Visiting Researcher** *Newark, DE*
University of Delaware Jun 2025 – present
Advisor: Prof. Sarah Dodson-Robinson
- Analyzing mathematical methods for distinguishing genuine planet discoveries from stellar noise.
 - Applied Gaussian Process (GP) modeling and frequency-domain techniques to disentangle stellar activity from planetary signals.
- Undergraduate Researcher** *Guatemala City*
Universidad del Valle de Guatemala Nov 2024 – May 2025
Advisor: Prof. Eduardo Rubio-Herrera
- Generation and analysis from exoplanetary transit data to detect and characterize exoplanets.
 - Developed an algorithm for detection and characterization of exoplanets using data from TESS using Gaussian Process (GP) modeling.

Appointments

- Teaching Assistant & Laboratory Assistant** *Guatemala City*
Physics Department, Universidad del Valle de Guatemala Jan 2024 – May 2025
- Designed and implemented laboratory guides for undergraduate physics courses, assisted in the setup and supervision of laboratory sessions, graded reports.
- FF2016 (Physics I) Jun 2024 – Nov 2024
 - FF2017 (Physics II) Jan – May 2024 & 2025
 - FF2018 (Physics III) Jun 2024 – Nov 2024
 - FF3027 (Mechanics I) Jan 2025 – May 2025

Teaching Experience

Tutor

Universidad del Valle de Guatemala

Guatemala City

Jun 2022 – present

- Provided 260+ hours of one-on-one tutoring for over 30 high school and college students, prepared personalized study materials, and tracked student progress.
- Precalculus, Calculus I, Calculus II, Calculus for Business, Differential Equations, Physics I, Physics II, and Physics III

Certifications

Professional Certificate in Data Science and Machine Learning

HarvardX (Harvard University)

Jul 2025 – present

- Introduction to Data Science with Python
- Machine Learning and AI with Python

Data Analysis with Python Certification

FreeCodeCamp

Oct 2022 – Nov 2022

- Python for Everybody
- Data Analysis with Python

Workshops & Conferences

Alpha-Cen Astronomy Summer School

Alpha-Cen (Central American and Caribbean Astrophysics)

Remote

Aug 2025

Towards the Habitable Worlds Observatory: Visionary Science and Transformational Technology

NASA's Habitable Worlds Observatory

Washington, DC

(Remote)

Jul 2025

- Poster: *Disentangling Planetary and Stellar Signals in Barnard's Star*

Sagan Summer Workshop: Exoplanet Demographics

NASA Exoplanet Science Institute California Institute of Technology

Pasadena, CA (Remote)

Jul 2025

- Poster: *Disentangling Planetary and Stellar Signals in Barnard's Star*

Workshop on Astrophysics of High Energies and Cosmology

Universidad Nacional Autónoma de México (UNAM)

Guatemala City

Nov 2024

Awards & Achievements

- Selected for Summer Visiting Researcher Program at the Department of Physics and Astronomy, University of Delaware out of 147 applicants.
- Top 10 National Mathematics Olympiad 2020
- Achieved university's most accurate experimental measurement of gravitational acceleration (**g**)
- 3x Distinguished Student Award, Universidad del Valle de Guatemala
- 2x National Soccer Scholar Champion
- IRONMAN 70.3 Finisher and Federated Triathlete

Technical Skills

Programming Languages: Python, L^AT_EX, R (Intermediate), Mathematica (Basic), Java (Basic)

Data Analysis and Probabilistic Modeling: Statistical inference, Gaussian Process (GPs) modeling, Markov Chain Monte Carlo (MCMC), Bayesian modeling, time-series analysis



Astronomy Tools: Astroquery, ExoCTK, Lightkurve, AstroPy, NWEch

Other Tools: Microsoft Office, PASCO Capstone, QGIS, Adobe Photoshop, Laser Cutting, 3D Printing, Arduino


Languages:

- Spanish (Native)
- English (C1)
- French (A2)
- Portuguese (A2)
- German (C1)

Outreach & Leadership

- Created and published educational physics content on YouTube, including a laboratory guide video with over **1,100 views**. [Link](#) 
- Authored a physics laboratory guide widely adopted by students and instructors at Universidad del Valle de Guatemala.
- Founded and managed a popular educational Instagram account focused on geography and linguistics — reached over **15,000 followers** and **5 million total views**. [Link](#) 
- Member, Physics Students Association — organized science talks and led outreach initiatives for high school students.
- Vice-President, High School Student Council — proposed and implemented student-led initiatives to improve academic and extracurricular life.

Talks & Posters

3. **Flores Gaitán, O.A.**, Dodson-Robinson, S., Ramirez Delgado, V., "*Disentangling Planetary and Stellar Signals in Barnard's Star*", Poster at NASA's Towards the Habitable Worlds Observatory: Visionary Science and Transformational Technology, Johns Hopkins University, Washington, DC, July 28-31, 2025.
2. **Flores Gaitán, O.A.**, Dodson-Robinson, S., Ramirez Delgado, V., "*Disentangling Planetary and Stellar Signals in Barnard's Star*", Poster at Sagan Summer Workshop, NASA Exoplanet Science Institute, California Institute of Technology, Pasadena, CA, July 23, 2025. [Link](#) 
1. **Flores Gaitán, O.A.**, "*Detecting and Characterizing Exoplanets Around M-Dwarfs with TESS*", Invited Talk at Universidad del Valle de Guatemala's Astronomy Club, Guatemala City, May 9, 2025.

Publications

2. **Flores Gaitán, O.A.** & Dodson-Robinson, S. In preparation
1. Zhao, L.L. et al., **including Flores Gaitán, O.A.**, *The Extreme Stellar-Signals Project IV*. In preparation