PATRICK COSTA

Astronomy Master's Student

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PCostaUW/github.io Patrick Costa PCostaUW

EXPERIENCE

Tutor/Curriculum Developer

Bright Panda

April 2025 – Ongoing Netherlands

- Engaged to design an introductory coding course from scratch with the intention of teaching it to a small group of high schoolers over a term of 8 weeks.
- Used Python turtle package to create an engaging game-design-oriented introduction to Python.
- Developed the entire curriculum with minimal guidance.

Tutor

Varsity Tutors

April 2024 – Ongoing Remote

- Tutored 1-on-1 with high school and undergraduate students.
- Primarily tutored physics and calculus as well as American standardized tests (AP and SAT).
- Received a high volume of positive feedback including 100% five-star reviews after helping students succeed on their tests.

PROJECTS

First Master's Thesis

Leiden University

October 2024 – Ongoing

- Investigating and modeling how exoplanets' atmospheres evaporate over time.
- Using existing literature and Python libraries to understand and implement atmospheric photoevaporation models.
- This project is part of the Astronomy Research MSc program at Leiden University and is projected to result in both a thesis paper and a published paper in late-2025.

Undergraduate Research / Research Assistant

University of Washington

March 2022 – September 2023

- Used partial differential equations, orbital mechanics, and Python to calculate the information matrix of the orbital elements in a planet-moon system transiting a star.
- Used machine learning algorithms (MCMC) to verify results.
- Hired part-time post-graduation to continue this work and determined the direction of the project with minimal guidance.

MOST PROUD OF

Successful Students
I have received rave reviews from students who I have worked with to meet their academic goals.

Relocating
Fear to move domestically and internationally has never stood in the way of me pursuing my goals.

Dog Training
The most rigorous course development I have conducted is for my young dog. Accomplishing the challenge of communicating with another species is something I take great pride in.

STRENGTHS

Passionate | Leader | Cooperative | Technologically Adept

Python | R | Data Visualization | Statistical Analysis | Calculus | Physics

LANGUAGES

English ●●●●●

Spanish ●●○○○

EDUCATION

M.Sc. Astronomy

Leiden University

Sept 2024 – Ongoing

B.Sc. Astrophysics

University of Washington

Sept 2019 – March 2023

CITIZENSHIP

United States of America

Ireland

Cosmological Modeling

University of Washington

February 2023 – March 2023

- Used supernovae data to develop a cosmological model for a hypothetical universe.
- Used machine learning methods to determine the composition of a universe.
- Used statistical analysis to evaluate the model's goodness of fit.

Observational Astronomy

University of Washington

March 2022 – June 2022

- Remotely connected to the Apache Point Observatory FlareCam telescope to observe a cluster of stars in different wavelengths.
- Performed data reduction and analysis using Python to estimate the cluster's age.
- Communicated findings in a final paper.

REFERENCES

Tyler Gordon Ph.D.
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