

Christopher Trejo

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EDUCATION

Cal. State University Northridge, CA

BSc, Physics with Astrophysics Concentration, May 2023

Senior Research Paper: “Determining Magnetic or Tidal Star-Planet Interactions for exoplanets using emission lines.” (Pending Publication)

Advisor: Dr. Damian Christian.

Los Angeles Pierce Community College, CA

AA, Mathematics, June 2021

AS, Physics, June 2021

AA, Gen. Studies: Social and Behavioral Science, June 2021

AA, Gen. Studies: STEM, June 2021

RESEARCH INTERESTS

Exoplanet Research

- Exoplanet atmospheres and magnetic fields.
- Exoplanet and star system evolution.
- Exoplanet detection.

FELLOWSHIPS AND AWARDS

Certificate of Achievement – NASA Community College Aerospace Scholars

Certificate of Achievement – CSU – Gen Ed June 2021

Dean's Honor Roll – Pierce College

MANUSCRIPTS

"From a Global Fit for LISA's Galactic Binaries to a Catalog of Sources" – Johnson, A. D., Chatziioannou, K., Vallisneri, M., Roulet, J., **Trejo, C. G.**, & Gersbach, K. (Submitted to *pending*, preprint pending on arXiv, January 2024)

PRESENTATIONS AND SUBMISSIONS

“The Search for star-planet interactions in exoplanet systems with highly elliptical orbits” - **AAS Abstract and Poster submission for Jan 2025 ([link](#))**

“Determining Magnetic or Tidal Star-Planet Interactions for Exoplanets using emission lines.” - **CSUN, May 2023**

“Investigating the ability for redistribution of nutrients via mycelium transfer in zero gravity” – **MITTIC Competition, January 2022**

“Habitation Systems Concept Studies” - **NASA NCAS Competition, June 2021**

“Artemis Lunar Mission Proposal” – **NASA NCAS Competition, June 2021**

RELEVANT RESEARCH AND OTHER EXPERIENCES

Exoplanet Watch - NASA – Current

- Using EXOplanet Transit Interpretation Code (EXOTIC) to convert image files into transit light curves to detect exoplanet transitions from MicroObservatory and Table Mountain Facility Telescopes.
- Submit Data to American Association of Variable Star Observers (AAVSO)

Star-Planet Interactions for exoplanets using emission lines - CSUN – 2023

- Analyzed HIRES KECK data to determine emission lines from an exoplanet transient.
- Discovered correlation between phase and flux in emission lines to establish potential magnetic field in exoplanet.
- Presented research and wrote a research paper to discuss findings. (pending publication)

Zooniverse Citizen Scientist Research – 2020 - Current

- Planet Hunters TESS – Reviewed light curves to look for transient exoplanets.
- Stellar Autopsies – Studied light curves of dying stars to classify types of supernovae.
- Planet Patrol – Analyzed images to confirm observed TESS data of stars and exoplanets in light curves.
- Backyard Worlds: Cool Neighbors – Analyzed images from the WISE surveys to locate brown dwarfs in the 3–5-micron wavelength.
- Bursts from Space - Analyzed radio emissions to try to locate Fast Radio Bursts using data from the CHIME telescope.

Gravitational Wave Open Data Workshop – 2022

- Crash course in GW and the Laser Interferometer Gravity-wave Observatory (LIGO).
- Learned how to handle data in frequency domain, develop Q-transforms.
- Searched for signals from Compact Binary Coalescence events using matched filtering.
- Worked on parameter estimation using Bayesian inference.
- Completed four data challenges that involved identifying a signal in white noise, colored noise, identifying merger time signal and SNR of the signal and finding signals in real LIGO data.

UBC Physics & Astronomy Launchpad Program– 2022

- Invited to in-person lab tours for prospective grad students, with one-on-one discussions with grad students and prospective research teams.
- Workshops in writing grant proposals, research proposals and grad school applications.

NASA L'SPACE Academy MITTIC Competition – 2022

- Program manager and researcher for a concept paper for a current NASA IP.
- Researched and developed a solution to use a mycelium network to distribute water and nutrients in order to grow vegetation in low or zero gravity environments.

Intro 2 Astronomy Research – 2021 Hosted by Dr Fei Dai (Caltech) and Dr Howard Isaacson (Berkeley)

- Crash course in Python, Unix, Matplotlib, NumPy and Pandas.
- Learned to use data archives Gaia, TESS, MAST, and the Exoplanet Archive.

- Fitting transit light curves and modeling radial velocities.
- Worked through examples for machine learning and Bayesian inference.

NASA Community College Aerospace Scholars – 2021

- Researched and completed a paper on future habitation systems for long term lunar missions.
- Competed with a group as the Science Return Specialist to develop a future Artemis Lunar mission.
- Identified viable landing sites for water excavation on the lunar surface for future lunar colonies.

SLOOH (Institute of Astrophysics of the Canary Islands) - 2020

- Hands-on experience using telescopes and CCD cameras to capture images of space using FITS data.
- Experience tracking comets and solar activity.
- Planning and carrying out investigations using mathematics and computational techniques.
- Classification of celestial objects.
- Participate in science communication via star watch parties.

PROFESSIONAL EXPERIENCE

Data Scientist • Intern • Caltech - 06/23 – 06/24

- Developing front-end applications in python to analyze LIGO Catalogs. (<https://gwtdash.streamlit.app/>)
- Developed new methods to catalog continuous signals for processing for LISA.
- Finding solutions for increasing the confidence of LISA observational data using Hellinger distance and KL Divergence to test the reliability of the modules being developed for LISA. (Paper pending review for publication)

Mentorship/Tutor – 06/21 – Current

- Providing guidance to a fellow student who also switched careers to STEM later in life.
- Tutor mentee in college level math, chem and physics courses.
- Advise with internships, scholarships, and transfer applications to a four-year school.
- Private tutor for STEM topic

Tutor/Assistant • LAUSD – 02/24 – Current

- Tutoring K to 5th grade students in English and Math.
- Set up my own curriculum that follows the guidelines by the LAUSD.
- Perform assessments to gauge students' progress.
- Assist the lead tutor in preparing lesson plans and schedules for all the tutors.
- Work with teachers to focus on students' weaknesses.

Office Admin • State Farm Gwyn Petrick - 06/19 - 05/21

- AR/AP and bank reconciliation, budgeting, and invoicing.
- Website and media design, maintenance, and distribution.
- Arranging meetings, appointments, and executive travel.
- Covering reception and basic extensive administrative and clerical tasks.

Consignment Manager • Premier Auto Credit - 06/12 - 03/19

- Managed a team, day to day operations and underwrote new business.
- Analyzed Market Trends and negotiated prices.
- AR/AP and bank reconciliation.
- Managed logistics and large inventories.
- Increased revenue from 5 million to over 15 million in a single year.

SKILLS

Python, LabView, SQL, Excel and office suites, Photoshop, LaTeX, Vegas Pro.

PROFESSIONAL ASSOCIATIONS

AAVSO
Científico Latino
The Planetary Society Member
Slooh
National Space Society
Zooniverse

REFERENCES

Dr. Damian Christian

Research Advisor
Faculty - Physics & Astronomy
CSUN
damian.christian@csun.edu

Dr. Jonah Kanner

Supervisor
Senior Scientist - LIGO
Caltech
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Dr. Radha Ranganathan

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