Arthur Berberyan

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Education

University of California, San Diego (UCSD), La Jolla, CA. USA

Ph.D. Student in Astronomy & Astrophysics — September 2025 - Present

California State University, Northridge (CSUN), Northridge, CA. USA

M.S. (with Distinction) in Physics — August 2023-May 2025
Sigma Pi Sigma Honor Society
Thesis: *Mode Coupling of Magnetic Bright Points in the Solar Atmosphere*

B.S. (cum laude) in Physics — August 2021-May 2023
Specialization: Astrophysics

Recent Coursework

Sel. Topics in Astrophysics (Solar Dynamics, Exoplanets), Classical Mechanics, E&M Theory, Statistical Mechanics, Quantum Mechanics, Optics, Radiative Transfer, Core Astrophysics and Physics

Skills

Observational and Computational Astronomy, Python, IDL, LaTeX, LabVIEW, Lab Experience, Teaching

Publications

A. Berberyan, et al., "*A search for mode coupling in magnetic bright points.*", Astronomy & Astrophysics (A&A), First authored publication. [DOI] (August 2024)

J. T. Clark, et al., "*Spinning up a Daze: TESS Uncovers a Hot Jupiter Orbiting the Rapid Rotator TOI-778.*", The Astronomical Journal 165, [DOI]. (April 2023)

Presentations & Conferences

The search for star-planet interactions in exoplanet systems with highly elliptical orbits. 245th annual American Astronomical Society (AAS), National Harbor, Maryland. [iPoster]. (January 2025)

Searching for mode coupling in magnetic bright points. Presentation for the CSUN Department of Physics & Astronomy Colloquium, Northridge, CA. [slides]. (September 2024)

The Search for Mode Coupling in the Lower Solar Atmosphere. Poster board presentation for the 22nd Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, University of California, San Diego, CA. [DOI]. (June 2024)

The Recent Solar Eclipse and Understanding Mode Coupling in Our Sun. Committee presentation for winning graduate award, Association of Retired Faculty (ARF), CSUN, [slides]. (May 2024)

A Search for Mode Coupling in Magnetic Bright Points. 1 of 3 undergraduate winners in the Department of Science & Mathematics, CSUNposium, Northridge, CA. (May 2023)

Elastic Wave Propagation in Compressed Phononic Crystals. Participation in the REU program (presented to university faculty, staff, and graduate students) at Princeton University (MAE). Princeton, NJ. [poster], [report]. (August 2022)

Research Experience

CSUN Solar Physics Group with Dr. Damian J. Christian — August 2021-Present

I am currently engaged in solar physics research at my institution. I investigate the coronal heating issue by studying mode coupling in magnetic bright points within the Sun's layers to understand how energy is transported to heat the chromosphere and overall energy budget.

- Contributed to the project by deriving light curves, calculating frequencies, and comparing period values (IDL) to theory/papers.
- High-processed imaging from Dunn Solar Telescope, New Mexico.
- Theoretical knowledge from previous courses aids me in utilizing IDL programming to gather and analyze data for my first publication.

Princeton University Summer REU with Dr. Andrej Košmrlj — June 2022-August 2022

Participated in an undergraduate research program at the Center for Complex Materials in Acoustic Metamaterials, investigating elastic wave propagation in compressed phononic crystals.

- Collaborated with Princeton graduate students, incorporating Python coding using FEniCSx, found solutions for PDEs, and gained insights into how elastic waves behave in deforming materials.
- My research showcased promising applications in noise reduction and vibrational control. I had the opportunity to present my findings to faculty and fellow graduate students through a poster session, contributing to compelling academic discourse.

IPAC (Caltech) Research Assistant with Dr. David R. Ciardi August 2019-August 2020
Data were used from NASA's TESS Satellite, Palomar, Keck Observatories, ExoFOP (Exoplanet Follow-up Observing Program) and the NASA Exoplanet Science Institute (NExScI) archive to process imaging and categorization of 150+ TESS Objects of Interest (TOI) stars with exoplanets.

- Organized and analyzed observational stellar data. Calculated star magnitudes, distances, separation, luminosities, and analyzed data using the interactive display tool of ATV in IDL.
- High-resolution image processing with a concentration in near-infrared adaptive optics.
- Conclusions showcased contributions to our understanding of potential habitable planets and their host stars.

Palomar Observatory Research Assistant June 2019
First experience in research by analyzing data collected with the telescope.

- Collaborated with Caltech astronomers on the 200-inch Hale telescope to capture imaging of star systems with candidate exoplanets.
- Capturing images with the telescope and utilizing the data for the scientific classification of individual stars and data set analysis from high-quality image processing.

Educational Experience

Teaching Associate, Department of Physics & Astronomy at CSUN August 2023-Present

- Significantly contributed to students' academic success in various subjects, including electromagnetism, circuits, optics, astronomy, mechanics, statistical analysis, and engineering.
- Simplified complex scientific concepts, enabling students to maximize their learning potential.
- My passion for teaching comes from my love of physics, and aspirations of becoming an academic researcher drive my enthusiasm. I have conducted 11 labs, graded, and held office hours.

Labs Conducted

CSUN ASTR 154L Observational Astronomy Lab, [slides], *Teaching Associate* August 2023-Present
CSUN PHYS 220AL Mechanics Lab, *Teaching Associate* January 2024-May 2024
CSUN PHYS 100B General Physics II, *Teaching Associate* August 2023-December 2023

Other Experience

NASA RockSat-X, *Mechanical Team/Assembly* August 2018-February 2020
NASA High Altitude Student Platform (HASP), *Chemical Team Lead* August 2017-December 2020
NASA L'Space Academy, *Project Lead* September 2018-December 2018
NASA Community College Aerospace Scholar October 2018-December 2018 (onsite June 2019)

News

[Journal Publication] from the Association of Retired Faculty Award July 2024
[COC News Release] on my experiences with NASA opportunities. January 2019

Awards & Honors

2025-2026 UCSD Astronomy & Astrophysics Achievement Award
2025 Sigma Pi Sigma Honor Society Member, American Institute of Physics
2024 Department of Physics & Astronomy Travel Award – $1,500
2024 Department of Physics & Astronomy Summer Research Award – $4,000
2024 The Debra Costa Graduate Student Scholarship – $1,500
2024 Association of Retired Faculty Award (1 of 2 in Physics since 1999) [list]– $2,500
2023 CSUNposium awardee in the Department of Science & Mathematics – $250
2023 Betty and Martin Altshiller Memorial for Outstanding Undergraduates – $1,000
2023 Paul and Amy Lee Undergraduate Scholarship for Excellence – $1,500
2022-2023 CSUN Undergrad Department of Science & Mathematics Dean's List
2021 MSP SAGE Society Scholarship – $1,200
2019 California Space Grant Consortium – $1,000
2018 NASA Community College Aerospace Scholar (NCAS)

Community Involvement

CSUN Star Party, *Celestron NexStar 8SE (8") Telescope Operator* March 2025
CSUN Science Day Fair, *Student / Experimental Demonstrator* May 2023, 2024
CSUN Society of Physics Students, *Member* August 2021-Present
CSUN Underrepresented Students in STEM Program, *Mentor* June 2023
Princeton Partnership with Trenton High School Students, *Mentor* June-July 2022

References

Dr. Damian J. Christian
Professor of Physics & Astronomy at CSUN, **Email:** damian.christian@csun.edu, **Tel:** (818) 677-2769.

Dr. Andrej Košmrlj
Associate Professor of MAE at Princeton, **Email:** andrej@princeton.edu, **Tel:** (609) 258-8613.

Dr. David R. Ciardi
Deputy Director of NExScI at IPAC/Caltech, **Email:** ciardi@ipac.caltech.edu, **Tel:** (626) 395-1834.