# Arthur Berberyan

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https://arthurberberyan.github.io/home/

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

Specialization: Astrophysics

August 2021-May 2023

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 [COC News Release] on my experiences with NASA opportunities.

July 2024 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

CSUN Science Day Fair, Student / Experimental Demonstrator

CSUN Society of Physics Students, Member

CSUN Underrepresented Students in STEM Program, Mentor

Princeton Partnership with Trenton High School Students, Mentor

March 2025 May 2023, 2024 August 2021-Present June 2023 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.