

NAOMI CARL

(815) · 277 · 7893 ◇ nfcarl@ucsb.edu ◇  0009-0008-1481-0238 ◇ [LinkedIn](#)

EDUCATION

University of California, Santa Barbara

Physics (Astrophysics) Ph.D. Student

August 2025 - Present

Santa Barbara, CA

- Advised by Dr. Caitlin Casey. Exploring the early universe with JWST COSMOS-Web.

Arizona State University: Barrett, The Honors College

B.S. in Astrophysics, B.S. in Physics

August 2021 - May 2025

Tempe, AZ

- 4.0 GPA. Moeur Award Recipient. Dean's List, 2021, 2022, 2023, 2024. Minor in Horn Performance.

RESEARCH EXPERIENCE

NASA Space Grant Program

Dr. Sanchayeeta Borthakur, Arizona State University

August 2022 - May 2025

Tempe, AZ

- Researched star formation in galaxies using optical imaging data and Spectral Energy Distribution modeling. Used software including Python, Source Extractor, DS9, and Code Investigating GALaxy Emission.
- Volunteered at public outreach events by performing informal astronomy education.

The Leadership Alliance at University of Chicago

Dr. Alexander Ji, University of Chicago

June 2024 - August 2024

Chicago, IL

- Performed spectroscopic analysis of a stellar stream to search for multiple stellar populations.
- Attended professional development and leadership workshops.
- Usman, S., **Carl, N.**, Ji, A., Kuehn, K. High-Resolution Chemical Abundances Of The GD-1 Stellar Stream (in preparation)

RENTU at Brown University

Dr. Judd Bowman, Dr. Steven Murray, Arizona State University

May 2023 - December 2023

virtual

- Participated in Brown University's Research Experience for Non-Traditional Undergraduates (RENTU)
- Successfully debugged package for analyzing the Hydrogen Epoch of Reionization Array (HERA).
- Interpolated beam data points and ran simulations, including spherical harmonics and Fourier transforms.

Educational Research In Radio Astronomy (ERIRA)

Dr. Dan Reichart, University of North Carolina

July 2023 - August 2023

Green Bank, West Virginia

- One of twenty students selected to participate in radio astronomy research at Green Bank Observatory
- Trained in radio telescope operations and analyses, including both astrophotography and data collection.

PUBLICATIONS

Carl, N., Borthakur, S., Jansen, R., Padave, M. (2025). A Stellar Renaissance: Exploring the Star Formation of Spiral Galaxy, NGC 3344. Barrett Honors Thesis. <https://keep.lib.asu.edu/items/200523>

Carl, N., Murray, S. (2023). Cubic & Fourier Interpolation Over Frequency for the HERA Vivaldi Beam. HERA Memo #126. reionization.org/manual_uploads/HERA126_beam_interpolation_NCarl.pdf

TEACHING & OUTREACH EXPERIENCE

Honors Experimental Lab Teaching Assistant

September 2025 - December 2025

Dr. Maxwell Millar-Blanchaer, University of California-Santa Barbara

Santa Barbara, CA

- Instructed lab section five days a week. Labs included laser attenuation, flow rate through a capillary, and a simple pendulum.
- Graded lab reports and other assignments.

Eclipse Ambassador for the Astronomical Society of the Pacific

March 2023 - May 2024

Volunteer Program, NASA Partner

Tempe, AZ

- Organized and hosted events pertaining to the solar eclipses and astronomy outreach, including education and safety training

Astronomy Teaching Aide

January 2023 - May 2023

Dr. Sanchayeeta Borthakur, Arizona State University

Tempe, AZ

- Assisted students in class and answered their questions in addition to grading papers

AWARDS

NSF GRFP Honorable Mention

April 2025, 2026

- One of 3000 out of 13000 honored in the NSF Graduate Research Fellowship Program

College Leader Award

November 2024

Arizona State University

Tempe, AZ

- 150 out of 30,000 students selected from The College of Liberal Arts and Sciences as a student leader based on professor recommendation, academic performance, and community involvement

TECHNICAL SKILLS

Coding & Software

Python, MATLAB, Astropy, LaTeX, Bash, C, GitHub, CIGALE, Source Extractor, DS9, Excel, Siemens NX CAD, Mathematica

Astronomy

Noise reduction, photometry, spectroscopy, modeling, simulations, cosmology, optical imaging, radio instrumentation, data collection, Exposure Time Calculator (ETC), Astronomer's Proposal Tool (APT)

Physics & Math

modern physics, thermodynamics, quantum mechanics, special relativity, calculus, linear algebra, statistics, laboratory work, classical physics

SERVICE ORGANIZATIONS

Graduate Student Association

November 2025 - Present

Santa Barbara, CA

- Physics representative for UC Santa Barbara graduate students
- Relay campus-wide updates and vote on funding allocations, help ensure equitable policies across campus
- Earned \$600 of funding for the Astro Lunch program at UCSB

SACNAS Graduate Mentor

November 2025 - Present

Santa Barbara, CA

- Served as an individual mentor through Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)
- Helped students prepare their personal statements and application materials for graduate school

Association of Women in Physics

March 2024 - May 2025

Tempe, AZ

- President (April 2024-May 2025), interim secretary (January 2024-April 2024).
- Founded the club and organized meetings. Demonstrated leadership capabilities.
- Worked with community to organize outreach and physics education opportunities to promote inclusivity.

Society of Physics Students

August 2023 - May 2025

Tempe, AZ

- Outreach Coordinator of club (March 2024-May 2025). Worked with local schools to organize events and physics demonstrations.
- Performed physics demonstrations and outreach at numerous community events.

School of Earth and Space Exploration Undergraduate Council

August 2023 - August 2024

Tempe, AZ

- Astrophysics representative to the council.
- Created an initiative to connect first-year students with faculty mentors.
- Developed a Canvas page for undergraduates for important announcements and resources.

CONFERENCE TALKS

Arizona Space Grant Consortium Statewide Symposium

April 2025

- **Carl, N.**, Borthakur, S., Jansen, R., "A Stellar Renaissance: Exploring the Star Formation of Spiral Galaxy, NGC 3344"
- Presented talk on research through the NASA Space Grant Program.

Leadership Alliance National Symposium

July 2024

- **Carl, N.**, Ji, A., Usman, S. "Salty Stars? Searching for Chemical Anomalies in Stellar Stream GD-1"
- Presented 15 minute talk on research findings from work at University of Chicago. [Watch here.](#)
- Attended leadership, research, and professional development workshops.

Arizona Space Grant Consortium Statewide Symposium

April 2024

- **Carl, N.**, Padave, M., Borthakur, S., "Star Formation History of NGC 3344"
- Presented talk on research through the NASA Space Grant Program. [Watch here.](#)

Arizona Space Grant Consortium Statewide Symposium

April 2023

- **Carl, N.**, Padave, M., Borthakur, S., "In with the Old, Out with the Young: Stellar Clusters in NGC 3344"
- Presented talk on research through the NASA Space Grant Program. [Watch here.](#)

OUTREACH EVENTS

Solar Eclipse Safety Preparation

September 2023

- Organized and hosted an event with the ASU library to provide information and safety training for the upcoming solar eclipses, as part of the Astronomical Society of the Pacific's Eclipse Ambassador Program
- Gave a talk on history of solar eclipses and different viewing strategies, and invited other space-related groups to table at the event
- Estimated reach of approximately 100 participants

Solar Eclipse Viewing Party

October 2023, April 2023

- Organized and hosted a viewing party with the the Eclipse Ambassador Program and NASA Space Grant
- Showed ASU students how to use our solar telescopes and view the solar eclipse safely
- Answered questions about the solar eclipse, and was interviewed by Telemundo Arizona about my work

- Handed out eclipse glasses to over 1000 people, estimated reach of several thousand total

School of Earth and Space Exploration (SESE) Mentor

September 2023.

- Mentored students throughout the school year, led students in classwork
- Acted as camp counselor for students at "Camp SESE" for a weekend at Tonto Creek camping grounds
- Guided students through hiking trips, telescope viewing, and research talks

ASU Open House with LoCo Lab

October 2022, March 2023, October 2023

- Tabled with the Low-Frequency Cosmology (LoCo) Lab, and taught community members about the Cosmic Microwave Background (CMB)
- Demonstrated how radio telescopes and interferometers work, including HERA and EDGES
- Explained my research and discussed the importance of measuring the 21 cm line in radio astronomy

ASU Open Door with SPS

February 2024

- Worked with Society of Physics Students (SPS) at ASU Open Door, where thousands of community members visit ASU
- Performed in the SPS Demonstration Show, showing the audience the power of momentum with the bowling ball demo and spinning tire wheel demo
- Showed families how black holes work, with marble and table cloth interactive demonstration
- Explained properties of light using various tools such as polarization filters, color filters, and more

ASU Open Door with AWiP

October 2024

- Tabled at ASU Open door as President of the Association of Women in Physics (AWiP)
- Designed women in physics trivia, and gave out prizes (stickers, pins, and candy) to winners
- Gave physics themed crafts to children at open door, including origami physicists and make-your-own science bracelets

OTHER PRESENTATIONS

Guide to Informal Education

September 2024

NASA Space Grant Orientation

Tempe, AZ.

- Instructed new interns on how to do science outreach and communication

Interpolating the HERA Vivaldi Beam

August 2023

School of Earth and Space Exploration Internal Symposium

Tempe, AZ

- Presented the results of my work with Research Experience for Non-Traditional Undergraduates (RENTU) to the department of Earth and Space Exploration in a 10 minute talk

Spaceworks 1: Preliminary Design Review

November 2023

Spaceworks 1: Design, Test, and Build

Tempe, AZ

- Worked with my class group to deliver our preliminary design review to members of Jet Propulsion Laboratory (JPL) and faculty after designing a payload delivery system

CONFERENCES & WORKSHOPS

COSMOS Collaboration Meeting

July 2026

- Served as part of the LOC and helped organize social events and logistics for the conference.

National Diversity in STEM Conference

October 2024

Society for Advancement of Chicanos/Hispanics & Native Americans in Science

Phoenix, AZ

- Attended leadership workshops for fostering a diverse community

- Volunteered as an exhibitor for the NASA Space Grant Program

ALMA Data Reduction Workshop

October 2024

Dr. Patrick Kamieneski, Arizona State University

Tempe, AZ

- Two-day workshop for the Atacama Large Millimeter/submillimeter Array led by Dr. Kamieneski
- Learned to create images and reduce data using Cube Analysis and Rendering Tool for Astronomy (CARTA) and Common Astronomy Software Applications (CASA) package

Dwarf Galaxies, Star Clusters, and Streams in the LSST Era

July 2024

- Took part in talks and poster sessions at the University of Chicago.

Conference for Undergraduate Women in Physics

January 2024

- Collaborated in workshops on creating a more inclusive space in physics and professional development.

Oases in the Cosmic Desert: Understanding the Structure of the CGM

February 2023

- Acted as a mic runner and volunteer in addition to attending talks and poster sessions.

Barrett Leadership Conference

October 2023

- Attended talks and workshops on developing skills as a leader in the honors community

OTHER WORK & INTERESTS

UCSB Jazz

March 2026 - Present

- Vocalist with the University of California, Santa Barbara, jazz program under the direction of Dr. Jonathan Nathan

Marketing Assistant for Barrett, the Honors College

February 2022 - May 2025

Chris Cardona, Arizona State University

Tempe, AZ

- Attended student events, conducted interviews, and created social media content

Arizona State University Wind Symphony

August 2021 - May 2025

- Studied French horn under Dr. John Ericson and performed with the studio ensemble.
- Performed at the College Band Directors National Association conference in Las Vegas.
- Assisted with social media management and other band logistics.

Languages

- Mandarin Chinese: 3 years of instruction in high school, Commended Biliteracy on STAMP test
- Italian: Completed 1 semester of instruction and studied abroad in Lecce, Italy over winter break