

Dr. Caleb R. Choban

COMPUTATIONAL ASTROPHYSICIST · INTERSTELLAR DUST ENTHUSIAST

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Education

University of California San Diego

PH.D. IN PHYSICS

San Diego, CA

2016 - 2023

University of California San Diego

B.S. IN PHYSICS W/ SPEC. IN ASTROPHYSICS (CUM LAUDE)

San Diego, CA

2011 - 2015

Research Experience

Inaugural Sullivan Prize Fellow

IU BLOOMINGTON DEPARTMENT OF ASTRONOMY

2023-PRESENT

- Investigating the emergence of dust in the early Universe with cosmological zoom-in simulations
- Using radiative transfer codes to forward-model observables from simulations

Graduate Student Researcher

UC SAN DIEGO DEPARTMENT OF PHYSICS

Advisor: Dušan Kereš

2016 - 2023

- Developed and integrated galactic dust evolution models into the massively parallel C package GIZMO
- Investigated the evolution of galactic dust populations utilizing cosmological zoom-in simulations

Undergraduate Student Researcher

UC SAN DIEGO DEPARTMENT OF PHYSICS

Advisor: Adam Burgasser

2014-2016

- Contributed to the development of the public SPLAT Python package, used to access and analyze brown dwarf spectra
- Developed a machine-learning clustering algorithm to identify rare populations of stars and brown dwarfs

Skills

Programming Python · C/C++ · Mathematica · LaTeX · Parallel programming with MPI/OpenMP · Meshless finite mass codes

Other Big data analysis · Utilizing several national supercomputers · Forward-modeling observations

Presentations & Posters

Physics and Astronomy Colloquium

INVITED TALK

University of Toledo

2026

New Data that Challenges Underlying Assumptions in Early Galaxy Evolution

CONTRIBUTED TALK

Schiodic Institute

2025

Kavli Summer Program in Astrophysics

INVITED TALK

UVA

2025

Star Formation & ISM Seminar

INVITED TALK

CCA Flatiron

2025

Astrophysics Seminar

INVITED TALK

Purdue University

2025

Evolution of Dust and Gas throughout Cosmic Time

CONTRIBUTED POSTER PRIZE WINNER

Hiroshima, Japan

2024

Building Physical Simulations of PAH Emission in Galaxies II Workshop

INVITED TALK

University of Virginia

2024

Santa Cruz Galaxy Workshop

CONTRIBUTED TALK

UC Santa Cruz

2024

Journal Club

INVITED TALK

UI Urbana-Champaign

2024

The Impact of Astrophysical Dust: From Star Formation through Cosmology

CONTRIBUTED TALK

Aspen Center for Physics

2024

Astronomy Seminar

INVITED TALK

University of Notre Dame

2024

Illuminating the Dusty Universe: A Tribute to the Work of Bruce Draine

CONTRIBUTED TALK

Galileo Galilei Institute, Italy

2023

Olympian Symposium: Star Formation in the Era of JWST

CONTRIBUTED TALK

Paralia, Greece

2023

Friday Lunch Time Astrophysics Seminar

INVITED TALK

UC Santa Cruz

2023

Star Formation/ISM Rendezvous (SFIR) Seminar

INVITED TALK

Princeton

2022

CCA Galaxy Formation Meeting

CONTRIBUTED TALK

Flatiron

2022

Galaxy Formation and Evolution in Southern California

CONTRIBUTED TALK

FIRE Collaboration Seminar

INVITED TALK

Osterbrock Sierra Conference

POSTER/TALK

Dusting the Universe Conference

POSTER

UCSD Undergraduate Research Conference

CONTRIBUTED TALK

Summer Undergraduate Research Conference

CONTRIBUTED TALK

California Inst. of Tech.

2016, 2018, 2019, 2022

Virtual

2021

Sequoia National Park

2021

Univ. of Arizona

2019

UC San Diego

2015

UC San Diego

2014

Community Engagement

MENTORSHIP/LEADERSHIP

Kavli Summer Program in Astrophysics

MENTOR

2025

PYIU: Python Crash Course and Workshop for Scientists

2024-2025

ORGANIZER AND PRESENTER

Alice Palma Undergraduate Program

2022-2025

ORGANIZER AND MENTOR

Graduate/Undergraduate Peer-to-Peer Mentoring Program

2019-2023

FOUNDER AND ORGANIZER

Physics Graduate Council

2018-2023

REPRESENTATIVE

Society of Physics Students

2014-2016

VICE PRESIDENT

PUBLIC SPEAKING

Hutton Honors Council Association

2024

JWST: OUR DUSTY UNIVERSE

Science on Screen: Buskirk-Chumley Theater

2024

GALAXY MOVIE THEATER: SIMULATING GALAXIES

Eclipsed by Chocolate: WonderLab Museum of Science

2024

THE HISTORY AND SCIENCE OF SOLAR ECLIPSES

SCIENCE OUTREACH

Solar Eclipse IU

2024

VOLUNTEER

San Diego Air & Space Museum Space Day

2022-2023

SCIENCE DEMONSTRATOR

Transfer Student STEM Research Seminar

2021

PRESENTER

UCSD Young Physicists Program

2018-2020

SCIENCE DEMONSTRATOR

San Diego Festival for Science and Engineering

2015-2020

SCIENCE DEMONSTRATOR

Southern California Physics Graduate Admissions Bootcamp

2016-2017

PRESENTER AND TUTOR

Institute of the Americas Science & Innovation Camp

2015-2017

SCIENCE DEMONSTRATOR

Intertribal Youth: Indigenize Education

2015-2017

SCIENCE DEMONSTRATOR

Honors, Awards, & Grants

Distinguished Senior Graduate Teaching Award

2023

AAS International Travel Grant

2023

UCSD Graduate Student Association Travel Grant

2019

NSF Graduate Research Fellowship, Honorable Mention

2018

UCSD Physical Sciences Dean's Undergraduate Award for Excellence

2015-2016

Provost Honours, UCSD

2013-2015

Teaching Experience

LAB ASSISTANT

PHYS 105A/B: Mathematical and Computational Physics I/II

PHYS 164: Observational Astrophysics Research Lab

PHYS 124: Laboratory Projects w/ Arduinos

PHYS 120: Circuits and Electronics Lab

PHYS 2CL: Physics Lab E&M, Waves, & Optics

LECTURE ASSISTANT

PHYS 163: Galaxies and Quasars
PHYS 162: Cosmology
PHYS 1B: Electricity and Magnetism
PHYS 13: Life in the Universe
PHYS 7: Galaxies and Cosmology

WORKSHOP INSTRUCTOR

Intermediate Introduction to Python
Time Management
Coding Design