

Ivey Davis

(they/them)

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Education

PhD. California Institute of Technology

Sept. 2022 - June 2025 (anticipated graduation)

Division of Physics, Math and Astronomy

Concentration: Astrophysics

M.Sc. California Institute of Technology

Sept. 2020 - June 2022

Division of Physics, Math and Astronomy

Concentration: Astrophysics

B.Sc. University of New Mexico

Aug. 2016 - May 2020

Department of Physics and Astronomy

Major: Astrophysics Minors: Mathematics, Linguistics

Organization Involvement and Leadership Positions

KISS Blazing Paths to Observing Stellar and Exoplanet Particle Environments

Nov. 2023-Present

I have been serving as the **working group lead** of the transient particle events working group apart of a larger concerted effort to identify the gaps in the astronomical community's understanding of stellar and exoplanet particle environments. As lead of the transient group, I have been working with an international group of scientists to discern observational and theoretical paths forward to detecting and describing stellar coronal mass ejections and energetic particle events.

Owens Valley Radio Observatory Long Wavelength Array (OVRO-LWA)

Oct. 2020-Present

I have been a **commissioner** of the power-beam (beamformed) observing mode of the OVRO-LWA. This has involved conducting regular observations, developing a framework for managing observation scheduling, defining standards for data-recorder products, and writing data-reduction pipelines for the data-recorder products.

Flarescope

Oct. 2020-Present

I am the **project scientist** for the **optical, photometric observatory Flarescope**. In this position, I designed Flarescope's observatory and optical path, installed the hardware, developed the code for automated observing and emergency shutdown procedure, and developed the data-reduction pipeline.

Skills

Radio data reduction and analysis

I have experience using **CASA**, **AIPS**, **python**, and **wsclean** to work with **cross-correlated** data and images from the **OVRO-LWA**, **Very Large Array**, and **Low-Frequency Array**. I have additional experience working with **beamformed** data from the **OVRO-LWA** and the **University of New Mexico LWA**.

Optical photometry reduction and analysis

I have used python to develop a data-reduction pipeline for **photometric images convolved with a novel point-spread function** to produce light curves. I also **developed code for automated flare-identification** in light curves from the Transiting Exoplanet Survey Satellite. This code has been successfully utilized by other scientists for similar work.

Instrument design and commissioning

I have experience in design, construction, calibration, and automation of optical observatories for achieving sub-mmag precision. I have additional experience with observing with low-frequency radio observatories and performing quality tests on the data.

Conferences, Workshops, and Invited Talks

Cool Stars 22	Contributed poster 60	June 2024
Radio Stars in the Era of New Observatories	Contributed talk	April 2024
AAS 243	Contributed talk 355.08	Jan. 2024
Science at Low Frequencies 2023	Contributed poster	Dec. 2023
KISS “Stellar and Exoplanet Particle Environments Workshop”		Nov. 2023
Palomar Science Meeting 2023	Contributed talk	June 2023
AAS 241 st Meeting	Contributed talk 346.07	Jan. 2023
Cool Stars 21	Contributed poster 231	July 2022
Yuk Lunch Seminar	Invited talk	June 2022
AAS 240 th Meeting	Contributed talk 107.03	June 2022
APS Four Corners Section	Contributed poster F01.00001	Oct. 2019
AAS 233 rd Meeting	Contributed poster 360.01	Jan. 2019

Publications

8. I. Davis, *et. al.*, “A 200-hour monitoring campaign of EK Dra at radio and optical wavelengths”, (in prep)
7. I. Davis, *et. al.*, “A dedicated system for coordinated radio and optical monitoring of the space weather of young, solar-type stars”, (in prep)
6. C. Ayala, D. Dong, I. Davis, “Stellar Transients in VLASS”, (in prep)
5. I. Davis, *et. al.*, “Detection of Radio Emission from Super-flaring Solar-Type Stars in the VLA Sky Survey”, (submitted)
4. M. Haynes, *et al.*, “HF Bistatic Radar Experiments with HAARP, UNM-LWA and OVRO-LWA for Planetary and Near-Earth Asteroid Science”, 2023
3. I. Davis, H. K. Vedantham, J. R. Callingham, T. W. Shimwell, “Rapid low-frequency spectral evolution of WX UMa”, 2021
2. J. R. Callingham, *et al.*, “The Population of M Dwarfs at Low Radio Frequencies”, 2021
1. Ivey Davis, Greg B. Taylor, & Jayce Dowell, “Observing Flare Stars Below 100 MHz with the LWA”, 2020

Outreach

Caltech Stargazing Lecture	Nov. 2024
Sequoia National Park Dark Skies Festival	Sept. 2024
iTelescope Webinar	Dec. 2023
Caltech Annular Eclipse Viewing	Oct. 2023
I organized a public outreach event to observe the partial annular eclipse from Caltech that was attended by ~1,000 people. I also gave a public lecture on solar radio science at Caltech.	
Astro on Tap: Pasadena	Sept. 2022
Owens Valley Radio Observatory Fall Lecture Series	Nov. 2021

Teaching, Mentorship, and Service

Astrobites Author	Jan. 2023 - Present
Selected writings:	
A Sleepy Grad’s Guide to Healthier Observing	
Making Sense of Convolved Images	
A Rad(iation) Belt Around an Ultracool Dwarf	
Caltech Gender Minorities and Women in PMA	2021-Present
Organizing Committee (2021-2024): Planned and ran events on campus relating to gender minorities and women in physics, math, and astronomy (PMA)	

President (2022-2023): Planned and ran biweekly committee meetings, oversaw quarterly events, and facilitated membership growths

Respect as Part of Research

2022-2024

I have been a **facilitator** and **organizer** for a yearly seminar for incoming Caltech physics, math, and astronomy graduate students to navigate new relationship dynamics. This has involved both training other volunteers and facilitating group discussions for a peer-led sexual harassment/sexual assault prevention.

Astronomy graduate student representative

Fall 2023- Fall 2024

Undergraduate summer research advisor

Summer 2024

Undergraduate research co-advisor

2023-2024

FUTURE of Physics volunteer

Summer 2023, 2024

I have been helping facilitate a CV writing workshop for undergraduate women and non-binary students.

Graduate Student Advisory Board

Fall 2022- Fall 2023

Graduate teaching assistant

Spring 2022