Tamar Ervin (she/her/hers)

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EDUCATION

Ph.D. **University of California, Berkeley, Physics.** *Expected Graduation 2028.*

B.S. **University of California, Los Angeles, Honors College. Astrophysics, Atmospheric and Oceanic Science.** *2022.*

PROFESSIONAL EXPERIENCE

University of California, Berkeley Space Sciences Lab *Berkeley, CA*

Parker Solar Probe (PSP) Science Working Group (SWG), Advisor: Dr. Stuart D. Bale *August 2022 - Present*

- Regularly present the results of PFSS models and predictions of magnetic field lines and footpoints for PSP encounters
- Studying the source region and evolution of unique solar wind streams through turbulence analysis and MHD models
- Current study looking at the evolution of particle VDFs through PSP radial scans to calculate diffusion coefficients

FIELDS Suite Principal Investigator (PI) —OCHRE Sounding Rocket, Advisor: Dr. John W. Bonnell *July 2024 - Present*

- Lead team of engineers in design, fabrication, and testing of the FIELDS instrument suite
- Work with Mission PI and other instrument PIs to define mission science questions and plan for launch
- Prepare for and present at mission meetings, coordinate with NASA Sounding Rocket Operations Center (NSROC)

Solar Orbiter Origins and Connection Science Working Group *January 2023 - Present*

- Collaborate with SWA/HIS and SPICE teams to determine the composition of solar wind from various source regions
- Present conjunction work using Solar Orbiter, Parker Solar Probe and 1AU data to understand solar wind evolution

FOXSI-4 Sounding Rocket, Advisor: Dr. Juan Camilo Buitrago-Casas *January 2023 - Present*

- Lead of the Solar Aspect and Alignment System (SAAS) including hardware assembly and software control
- Align X-ray optics modules through regular alignment sessions and result analysis
- Participate in rocket integration at SSL and White Sands Missile Range, and launch in April 2024 from Poker Flats

NASA Jet Propulsion Laboratory *Pasadena, CA*

Solar Physics and Exoplanet Research Intern, Advisor: Dr. Samuel Halverson *June 2021 – June 2022*

- Developed Python analysis pipeline (SolAster) to automatically calculate *SDO*/HMI derived RV variations and magnetic observables to better characterize stellar activity signals in ground-based RV measurements
- Built physically motivated spectral line masks using unsupervised clustering to isolate activity-sensitive features in the solar spectrum by determining correlation between spectral metrics and magnetic activity tracers

Predictive Science Inc. *San Diego, CA*

Solar Physics Intern, Advisor: Dr. Cooper Downs *May 2020 – June 2021*

- Built data driven methods to correct for limb-darkening and intensity variations among solar disk images
- Produced synchronic and synoptic CH/EUV maps for future forecasting and magnetic flux map creation

TEACHING AND MENTORING

University of California, Berkeley Space Sciences Lab *Berkeley, CA*

Mentor *August 2023 - Present*

- Diego Fernando Páez Restrepo: Master's student in Colombia studying solar wind interaction with Mars
- Kai Jaffarove [Aug 23 - Present]: fourth year undergraduate student analyzing PSP in situ slow solar wind observations
- Jack Collard [June 24 - Present]: fourth year undergraduate student studying proton entropy as a proxy for heavy ion ratios; quantifying uncertainty on potential field source surface models to connect in-situ observations to their source
- Sebastian Park [Summer 2025]: ASSURE REU Student studying heavy ion and elemental abundance in ICME material
- Angel Reyna [Summer 2024]: ASSURE REU Student studying quasi-periodic variations of the solar magnetic field

University of California, Berkeley Department of Physics *Berkeley, CA*

Physics Directed Reading Program *January 2023 - Present*

- Jack Collard: second year undergraduate student studying solar wind sources (Spring 2024)
- Bhoomi Naithani: first year undergraduate student studying direct dark matter detection methods (Spring 2024)
- Orestis Sabetai: first year undergraduate studying atmospheric composition of Mars (Fall 2023)

Head Graduate Student Instructor (HGSI) *January 2023 - May 2023*

- Support ~500 students in Physics 8B through course scheduling, worksheet creation, exam review sessions, etc.
- Lead the 12 GSIs for Physics 8B through weekly meetings, pedagogical activities, and section preparation

Graduate Student Instructor (GSI) *August 2022 – January 2023*

- Instructor to 50 students for four times weekly, two-hour discussion and lab sections lecturing on mechanics topics

COMMUNITY SERVICE

Parker Heliophysics Scholars Series *Berkeley, CA*
Science Organizing Committee (SOC) Member *January 2024 - Present*

- Organize the science agenda including contributed abstracts, plenary speakers, and interactive workshops

Advancing Space Science through Undergraduate Research Experience (ASSURE) *Berkeley, CA*
Summer Research Program Coordinator *December 2023 - Present*

- Organize REU program including identifying mentors, planning summer programming, giving overview talks, etc.
- Meet with student cohort (10 students) multiple times a week throughout the summer to lead office hours, professional development programming, journal clubs, and seminars
- Review and select undergraduate student applications for the REU program

COFFIES Drive Center *Stanford, CA*
Beans (Early Career Program) Steering Committee; COFFIES Effectiveness Team (CET) Member *January 2024 - Present*

- Coordinate mentor-mentee pairings and activities for the Beans program members
- Support CET activities by planning meetups and undergraduate outreach events at conferences such as AGU

Physics Directed Reading Program (PDRP) *Berkeley, CA*
Program Coordinator *August 2023 - Present*

- Solicit graduate students mentors and projects, review and pair undergraduates with graduate mentors
- Mentor 1-2 undergraduate students each term through a space physics related reading and basic data analysis projects

AWARDS

- **AAS/SPD Metcalf Award,** AAS/SPD. *July 2025.*
- **AAS/SPD Zirin StudentshipAward,** AAS/SPD. *May 2025.*
- **NASA Group Achievement Award,** NASA. *November 2023.*
- **Lin Fellowship,** UC Berkeley Space Sciences Lab. *June 2023.*
- **Phi Beta Kappa,** UCLA. *June 2022.*
- **UCLA Undergraduate Research Prize in STEM, 2nd Place,** UCLA. *June 2021.*
- **UC Regents Scholar,** UCLA. *August 2018.*
- **Big Band Theory Undergraduate Scholarship,** UCLA. *August 2018 - Present.*

PUBLICATIONS

- **Ervin T.** Mallet A., Erickson S., et al. "The impact of Alfv´enic shear flow on reconnection and turbulence.", *ApJL.* In Review.
- **Ervin T.,** Jaffarove K., Badman S.T., et al. "Characteristics and Source Regions of the Slow Alfvenic Wind Observed at Parker Solar Probe.", *ApJ.* September 2024.
- **Ervin T.,** Bale S.D., Badman S.T., et al. "Near subsonic solar wind emerging from an active region.", *ApJ.* July 2024.
- **Ervin T.,** Bale S.D., Badman S.T., et al. "Compositional metrics of fast and slow Alfvenic solar wind emerging from coronal holes and their boundaries.", *ApJ.* June 2024.
- Bowen T.A, **Ervin T.,** Mallet A., et al. "Stochastic heating in the sub-Alfvenic solar wind.", *Physical Review Letters*. In Review.
- Huang J., Larson D., **Ervin T.** et al. "The Temperature Anisotropy and Helium Abundance Features of Alfvénic Slow Solar Wind Observed by Parker Solar Probe, Helios, and Wind Mission.", *ApJ.* June 2025.
- Riley P., …, **Ervin T.** et al. "Understanding the global structure of the September 5, 2022, coronal mass ejection using sunRunner3D." *JSWSC.* May 2025.
- Rivera Y. J.., …, **Ervin T.** et al. "Differentiating the Acceleration Mechanism in the Slow and Alfvenic Slow Solar Wind.", *ApJ.* February 2025.
- Rivera Y. J., …, **Ervin T.** et al. "Mixed Source Region Signatures Inside Magnetic Switchback Patches Inferred by Heavy Ion Diagnostics." *ApJ.* October 2024.
- Sioulas N., …, **Ervin T.** et al. "Scale-Dependent Dynamic Alignment in MHD Turbulence: Insights into Intermittency, Compressibility, and Imbalance Effects." *ApJ. In Review.*
- Romeo O., …, **Ervin T.** et al. "Near In Situ and Remote Sensing Observations of a Coronal Mass Ejection and its Effect on the Heliospheric Current Sheet.", *ApJ.* September 2023.
- **Ervin T.,** Halverson S., et al. "Leveraging space-based data from the nearest Solar-type star to better understand stellar activity signatures in radial velocity data.", *AJ.* May 2022.
- Downs C., Turtle J., **Ervin T.,** Issan O., Caplan R., Linker J. **"**Coronal Hole Mapping, Identification, and Tracking: Methods", *In Preparation.*
- Tsan T. …, **Ervin T,** et al. "The Effects of Inclination on a two-stage pulse tube cryocooler for use with a groundbased observatory.", *Cryogenics*. July 2021.
- **Ervin T.** et al., "Coronal Hole Detection using Machine Learning Techniques." *UC E-Scholarship*. May 2021.

SELECTED PROFESSIONAL PRESENTATIONS

- **IAGA 2025 (Invited Talk),** "Turbulence and Heating of the Alfvenic Solar Wind". Sept *2025.*
- **AOGS 2025 (Invited Talk),** "Turbulence and Source Regions of the Slow Alfvenic Wind". July *2025.*

- **IAUS 400 (Metcalf Lecture),** "Source Regions and Characteristics of the Slow Alfvenic Wind". *July 2025.*
- **AAS/SPD Meeting 2025 (Oral),** "Empirical Measurement of Diffusive Heating in the Solar Wind". *June 2025.*
- **AAS/SPD Meeting 2025 (Oral),** "Sources and In-Situ Characteristics of the Alfvenic Solar Wind". *June 2025.*
- **EGU 2025 (Oral),** "Empirical Measurement of Diffusive Heating across Earth's Bowshock". *April 2025.*
- **AGU Fall Meeting 2024 (Oral),** "Empirical Measurement of Diffusive Heating in the Solar Wind". *December 2024.*
- **Parker Solar Probe / Solar Orbiter FIELDS Consortium Meeting,** "Near subsonic solar wind emerging from an active region". *February 2024.*
- **UC Berkeley Space Physics Seminar,** "Near subsonic solar wind emerging from an active region". *January 2024.*
- **AGU Fall Meeting 2023 (Poster),** "In situ measurement of slow solar wind from a pseudo streamer". *December 2023.*
- **Solar Orbiter Origins and Connections Science Working Group (Invited),** "Unlocking Solar Wind Source Regions: Insights from Parker Solar Probe and Solar Orbiter Conjunctions". *November 2023.*
- **Parker Solar Probe Spring SWG Meeting,** "Understanding the Origins of High Alfvenicity Slow Solar Wind". *March 2023.*
- **Parker Solar Probe Fall SWG Meeting,** "Understanding the Global Coronal Structure through PFSS Modeling of PSP Encounters". *November 2022.*
- **Caltech Exoplanet Group,** "Determining Activity Signatures in Ground-based Solar Radial Velocity Data". *March 2022.*
- **NASA Center for Geospace Storms 2021 Workshop (Invited),** ""Unsupervised and Supervised Machine Learning Methods for Coronal Hole Detection". *November 2021.*
- **NEID Team Science Meeting,** "Improving Our Understanding of Stellar Activity Using Space-based Solar Data". *August 2021.*
- **JPL Summer Presentation,** "Using Space-based Data to Independently Calculate 'Sun-as-a-star' RV Variations". *August 2021.*
- **UCLA Library Prize Ceremony,** "Coronal Hole and Active Region Detection using Machine Learning Methods". *June 2021.*
- **UCLA Undergraduate Research Week,** "Coronal Hole Detection using Machine Learning Methods". *May 2021.*
- **SPARTHRB Seminar,** "Coronal Hole Detection using Machine Learning Methods". *May 2021.*
- **AGU Fall Meeting 2020,** "An Improved Data Analysis Pipeline for Coronal Hole Detection and Mapping". *December 2020.*
- **Astronomy on Tap, San Diego,** "Data Analysis and Reduction for Imaging a Black Hole". *August 2019.*

OPEN SOURCE CODE

Space Physics Data Access Tutorials[1]**:** Python tutorials to access and analyze multi-spacecraft space physics data in Python

SolAster[2]**:** Python package to independently derive 'Sun-as-a-star' radial velocity variations and magnetic observables

CHMAP: Coronal Hole Mapping and Analysis Pipeline[3]: Python package for the detection, mapping, tracking, and general analysis of solar coronal holes

[1] https://github.com/tamarervin/tutorials
[2] https://github.com/tamarervin/SolAster
[3] https://github.com/predsci/CHMAP