

Tonya L. Peshel

tpeshel@stanford.edu | ORCID

EDUCATION

San Francisco State University Bachelor of Science, Physics: Astrophysics	2021 – 2024
Parkland College Physics & Astronomy Major	2017 – 2021
Valparaiso University International Service Major	2009 – 2011
Illinois Valley Community College Associate in Arts, <i>cum laude</i>	2007 – 2009

HONORS & AWARDS

Cal-Bridge Scholar	2022 – 2024
Dean's List	Fall 2019, Spring 2021 – 2024
Joyce and Dale Ewen Family Scholarship	2021
NASA Community College Aerospace Scholars (NCAS)	2019 – 2020

RESEARCH EXPERIENCE

KIPAC Post-Baccalaureate Fellow | Stanford University Jun. 2025 – Jun. 2026

X-RAY DETECTOR DEVELOPMENT, DR. STEVEN ALLEN & DR. TANMOY CHATTOPADHYAY

- Conducting beamline testing and analysis of readout performance for prototype X-ray CCD detectors.
- Modeling charge noise of Single-electron Sensitive Readout (SiSeRO) devices for future flagship observatories.

KIPAC Post-Baccalaureate Fellow | SLAC Natl. Accelerator Laboratory Jun. 2024 – Jun. 2025

DETECTOR CALIBRATION AND FABRICATION, DR. NOAH KURINSKY & DR. KELLY STIFTER

- Commissioned a THz calibration system for superconducting quasiparticle amplifying transmon (SQUAT) detectors for axion dark matter detection.
- Fabricated novel transition-edge sensor anti-coincidence detector designs for future X-ray probe missions using photolithography techniques at the Stanford Nanofabrication Facility.

Carnegie Astrophysics Summer Student Intern (CASSI) | Carnegie Observatories Summer 2023

GROUND-BASED INSTRUMENT DESIGN, DR. MAREN COSENS

- Found best-fit separation and precision requirements for the linear atmospheric dispersion corrector on the Magellan InfraRed Multi-Object Spectrograph (MIRMOS).
- Performed mechanical tolerancing and spot size analyses using Zemax OpticStudio.

OSTEM Research Intern | NASA Ames Research Center Spring 2023

SEARCHING FOR BROWN DWARFS WITH JWST, DR. THOMAS ROELLIG & DR. BEN LEW

- Identified 20 red compact objects as distant brown dwarf (BD) candidates using JWST NIRCam data.
- Performed aperture photometry and plotted color-color diagrams to distinguish BD candidates from high-redshift galaxies, resulting in 1 promising target for further analysis.

Cal-URSA Scholar | University of California, Berkeley Sept. 2021 – May 2022

IMAGING YOUNG BINARY STARS WITH OSIRIS, DR. GASPARD DUCHÊNE

- Wrote data reduction pipeline for Keck OSIRIS infrared data of pre-main-sequence binary star systems, resulting in 51 final combined images of 29 targets.
- Collected imaging and spectroscopic data using OSIRIS during a half-night remote observation.

Physics REU Intern | University of Illinois at Urbana-Champaign Summer 2021

PHYSICS EDUCATION, DR. ERIC KUO

- Performed statistical analysis of survey data to find the effects of an introductory undergraduate physics course on students' belonging and achievement.

TEACHING EXPERIENCE

Pedagogy Coursework | San Francisco State University

- ASTR 685: Advanced Planetarium Workshop, Spring 2024
- PHYS 685: Instructional Methods in Teaching Physics, Fall 2022
- PHYS 686: Introductory Planetarium Workshop, Spring 2022

Learning Assistant | San Francisco State University

- PHYS 240: General Physics with Calculus III, Fall 2022

Instructional Student Assistant (Grader) | San Francisco State University

- ASTR 115: Introduction to Astronomy, Spring & Fall 2022
- PHYS 101: Conceptual Physics, Fall 2021

Instructor | Boys & Girls Clubs of Portland Metropolitan Area

2012 – 2017

- Taught after-school literacy classes to 40 elementary students using the Slingerland Multisensory Approach.
- Developed and implemented STEAM summer camp curricula for K-8 students.
- Earned Certified REcharge Instructor credential through the KidWind REcharge Academy, a national educator training program focused on developing engineering design challenges for K-12 students.
- Trained educators to incorporate hands-on renewable energy curricula into after-school programs.

PUBLICATIONS

Refereed Publications

- J. Fuhrman et al. [incl. **T.L. Peshel**] “Simulation Driven Design of a Cryogenic Anti-coincidence Detector for X-ray Microcalorimeter Space Missions,” submitted to IEEE Transactions on Applied Superconductivity on 26 Sept. 2025.

Papers in Preparation

- T. Chattopadhyay, A.Y. Pan, **T.L. Peshel**, et al. “Sub-0.5-electron Noise Performance in the First Generation SiSeRO Devices: Measurement and Modeling of the Limiting Noise Floor,” submitted to JATIS by 31 Dec. 2025.
- **T.L. Peshel** et al. “RNDR Charge Modeling in First-Generation SiSeRO (Single-electron Sensitive Readout) Devices,” abstract submitted to SPIE Astronomical Telescopes + Instrumentation Conference on 3 Dec. 2025.
- T. Chattopadhyay et al. [incl. **T.L. Peshel**], “Output-Stage Design Optimization for High-Sensitivity SiSeRO-CCDs and SiSeRO Active Pixel Sensors,” abstract submitted to SPIE Astronomical Telescopes + Instrumentation Conference on 3 Dec. 2025.
- A.Y. Pan et al. [incl. **T.L. Peshel**], “First Results for Second Generation SiSeRO CCD Devices,” abstract submitted to SPIE Astronomical Telescopes + Instrumentation Conference on 3 Dec. 2025.
- D. O’Neill et al. [incl. **T.L. Peshel**], “The High-Speed FPGA Readout System for the Advanced X-ray Imaging Satellite (AXIS),” abstract submitted to SPIE Astronomical Telescopes + Instrumentation Conference on 3 Dec. 2025.
- H.R. Stueber et al. [incl. **T.L. Peshel**], “High-Speed, Low-Noise, Multi-Megapixel CCDs for Next Generation X-ray Observatories,” abstract submitted to SPIE Astronomical Telescopes + Instrumentation Conference on 3 Dec. 2025.

POSTER PRESENTATIONS

(Click to view)

- **T.L. Peshel**, C.P. Salemi, N. Kurinsky, K. Stifter, S.A. Stevens, H.I. Kowitt, E. Perry (2025, June 3). “A Cryogenic THz Calibration System for Ultra-Sensitive Sensors: Design and Initial Tests.” Low Temperature Detectors (LTD) Conference, Santa Fe, NM.
- **T.L. Peshel**, C.P. Salemi, N. Kurinsky, K. Stifter, S.A. Stevens (2024, November 20). “Towards THz Axion Detection: Characterization of Waveguides for Cryogenic Quantum Device Calibration.” Coordinating Panel for Advanced Detectors (CPAD) Workshop, Knoxville, TN.
- **T.L. Peshel**, M. Cosens, N. Konidaris, G. Rudie, A. Newman, T. Hare, L. Aslan, R. Barkhouser, J. Brady, G. Killion, A. Lanz, S. Ramirez, S. Smee, J. Williams (2024, January 10). “Determining the ADC Positioning Tolerances for MIRMOS.” 243rd Annual Meeting of the American Astronomical Society, New Orleans, LA.

★: Invited

- ★ **X-ray Detector Readout Development for the AXIS Space Probe**, The First International Symposium of Nonbinary Scientists, Virtual, Nov. 2025
- ★ **Advancing X-ray Astronomy with Fast, Low-Noise Detectors for Next-Generation Space Telescopes**, Physics & Astronomy Colloquium, San Francisco State University, Oct. 2025
- **Our Changing Moon: A Journey Through the Phases**, Charles F. Hagar Planetarium, San Francisco State University, May 2024
- ★ **My Summer Instrumentation Research at Carnegie Observatories**, Physics & Astronomy Colloquium, San Francisco State University, Dec. 2023
- **Investigating the ADC Precision for MIRMOS**, Undergraduate Research Symposium, Cal-Bridge Fall Conference, UC Berkeley, Oct. 2023
- **Investigating the ADC Precision for MIRMOS**, Carnegie Summer Student Symposium, Carnegie Observatories, Aug. 2023
- ★ **My REU Experience**, Physics & Astronomy Colloquium, San Francisco State University, Jan. 2022
- **Mapping the Orbit of Young Stellar Binaries**, Cal-URSA Research Symposium, UC Berkeley, Dec. 2021
- **Assessing Belonging & Self-Efficacy in Phys100 Students**, Physics REU Symposium, University of Illinois at Urbana-Champaign, Aug. 2021
- **Simulating the Evolution of the Universe: An Independent Study of the Millennium Run**, Science Club Seminar, Parkland College, May 2021

LEADERSHIP & OUTREACH

- **KIPAC Stargazing Volunteer**, Stanford University Student Observatory, Aug. 2024 – Jul. 2026
- ★ **Panelist**, “Career Panel for East Side Union High School District Students,” KIPAC, Stanford University, Nov. 2025
- **Visualization Lab Volunteer**, SLAC Community Day, SLAC National Accelerator Laboratory, Oct. 2025 [postponed due to govt. shutdown]
- **Member**, KIPAC Retreat Planning Committee, Stanford University, Jul. – Sept. 2025
- ★ **Panelist**, “Career Panel for East Side Union High School District Students,” KIPAC, Stanford University, Sept. 2025
- **Volunteer Delegate**, High Energy Physics Advocacy Trip, SLAC Users Organization, Washington, D.C., Apr. 2025
- **Lecture Series Moderator**, KIPAC + Friends Community Day, Stanford University, Apr. 2025
- **Group & Volunteer Lead**, Community Day Organizing Committee, Stanford University, Nov. 2024 – Apr. 2025
- **KIPAC Activity Volunteer**, Family Science Day, College of San Mateo, Sept. 2024
- **Observatory Docent**, San Francisco State University, 2021 – 2024 (**Lead Docent** Spring 2024)
- **Events Coordinator**, Students of Physics and Astronomy: a Community for Everyone (SPACE), San Francisco State University, 2023 – 2024
- **Treasurer**, SPACE, San Francisco State University, 2022 – 2023
- ★ **Panelist**, “Transitioning from Community College to a 4-Year College,” APS Conferences for Undergraduate Women and Gender Minorities (CU*iP), University of Illinois at Urbana-Champaign, Jan. 2022 [cancelled due to COVID-19]
- ★ **Panelist**, “Parkland Science Scholars: Panel of Undergrad Researchers,” Parkland College, Oct. 2021
- **Vice President**, Science Club, Parkland College, 2020 – 2021
- ★ **Panelist**, “Applying to REUs,” Parkland College, Feb. 2021
- **Project Manager**, Virtual NCAS Lunar Mission Design Competition, Summer 2020
- **Volunteer Event Assistant**, Regional Science Olympiad, Parkland College, 2018 – 2020

CONFERENCES & WORKSHOPS

NASA's Physics of the Cosmos (PhysCOS) 2nd Early Career Workshop, Virtual, Sept. 2025
Low Temperature Detectors (LTD) Conference, Santa Fe, NM, Jun. 2025
Berkeley Axion Workshop, Lawrence Berkeley National Laboratory, May 2025
Coordinating Panel on Advanced Detectors (CPAD) Workshop, University of Tennessee, Knoxville, Nov. 2024
ASP2024: Astronomy Across the Spectrum, Astronomical Society of the Pacific, Virtual, Aug. 2024
AstroTech Summer School, UC Berkeley, Aug. 2024
243rd AAS Winter Meeting, New Orleans, LA, Jan. 2024
APS CU*iP, SLAC National Accelerator Laboratory, Jan. 2024
Bay Area Exoplanets Meeting, NASA Ames Research Center, Apr. 2023
APS CU*iP, UC Santa Cruz, Jan. 2023
AstroTech Summer School, UC Berkeley, Aug. 2022
APS CU*iP, Virtual, Jan. 2022 & 2021

PROFESSIONAL MEMBERSHIPS

The International Society of Nonbinary Scientists, Dec. 2024 – Present
Kavli Institute for Particle Astrophysics and Cosmology (KIPAC), Jun. 2024 – Present
San Francisco Amateur Astronomers, Jun. 2024 – Present
American Astronomical Society (AAS), Aug. 2023 – Present
American Physical Society (APS), Oct. 2020 – Present
Space Generation Advisory Council, Mar. 2020 – Present