Nazende ipek Kerkeser

California Institute of Technology
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EDUCATION

California Institute of Technology, Pasadena, CA
PhD in Physics, 2025-Present

Steward Observatory, University of Arizona, Tucson, AZ
Bachelor's Degree, Major in Astronomy and Minor in Physics, 2022-2024

Broward College, Fort Lauderdale, Florida, USA
Associate of Art, High Honors, 2020-2022

Yildiz Technical University, Istanbul, Turkey
Bachelor's Degree in Physics, Transferred to Broward College, 2017-2020

WORK EXPERIENCE

Graduate Research Assistant, 2025-Present
Advisor: Dr Fiona A. Harrison, Caltech, Pasadena, CA
Conducting CMOS detector characterization for NASA's UVEX Explorer mission, including photon transfer curve (PTC) and quantum efficiency (QE) measurements. Managing laboratory operations and configuring dewar vacuum-chamber test setups. Performing data reduction and analysis to evaluate detector performance and support mission readiness.

Research Technologist, 2024-2025
Hamden UV/VIS Lab, University of Arizona, Tucson, USA
Developing test setups for characterization of UV detectors. Supporting optical testing, alignment, and calibration activities for NASA-funded Aspera SmallSat Mission.

Undergraduate Research Assistant, 2022-2024
Hamden UV/VIS Lab, University of Arizona, Tucson, USA
Specialized in characterization and testing of Ultraviolet (UV) astronomical instruments and detectors.

Telescope Operator for Raymond E. White, Jr. 21" Telescope, 2022-2024
Steward Observatory, University of Arizona, Tucson, USA
Extensively trained to run the historic 21-inch telescope; Single-handedly operated the telescope for 41 nights; Led the public nights and community short lectures; Assisted students with their observation projects.

Orientation Leader, 2021-2022
Broward College Admission/registration, Fort Lauderdale, Florida, USA

Hosted virtual and in-person orientations, assisting students through their registration process, supervised team members, and made outreach on behalf of the College

Student Ambassador, 2020-2021
Broward College Student Life, Fort Lauderdale, Florida, USA
Conducted orientation sessions, maintained attendance records and student data in online systems, and facilitated students' transition into college.

Math and Physics Tutor for Primary to Middle School Levels, 2020-2021
Miami, Florida, USA
Specialized in simplifying complex concepts, fostering an engaging learning environment, and improving students' confidence and academic performance through personalized instruction and problem-solving skills.

CURRENT & PAST RESEARCH

1. UVEX Explorer Space Telescope, (PI: Dr. Fiona A. Harrison)
UVEX is a NASA Explorer-class ultraviolet/optical survey mission that will map the transient and variable universe in UV and provide rapid-response spectroscopy for astrophysical events. **($300M)**.
Member: Detector characterization, ground calibration, and data analysis working groups.

2. Aspera SmallSat, (PI: Dr. Carlos Vargas)
Aspera is a SmallSat telescope from NASA's 2020 Astrophysics Pioneers Program that images emission in the circumgalactic medium (CGM) of nearby edge-on galaxies. **($20M)**.
Member: In-orbit and ground calibration working group.
Member: Science and Optical design and analysis working groups.

3. Hamden UV/VIS Detector Lab (HUVD), (PI: Dr. Erika Hamden)
Development of Vacuum UV detector characterization facility and cleanroom; Characterizing QE, noise, and dark current for UV-optimized EMCCDS for use on future space missions.

4. Faint Intergalactic Redshifted Emission Balloon (FIREBall-2)
Collaboration: Caltech-JPL, Columbia University, Laboratory of Astrophysics, Marseilles, University of Iowa, NASA, CNES
FIREBall-2 is a balloon-borne sub-orbital telescope with a multi-object spectrograph (MOS) designed to measure the faint emission from the Intergalactic Medium. The project is jointly funded by NASA and the National Centre for Space Studies (CNES), France.
Built the first ever in-flight capable calibration system. Facilitated the optical alignment of Field Corrector assembly using Computer Generated Holograms.

5. The Circumgalactic Hα Spectrograph (CHαS)
Department of Astronomy, Columbia University, Advisor: Prof. David Schiminovich and Dr. Nicole Melso

CHαS is an Integral Field Unit (IFU) spectrograph designed to detect faint H-Alpha (Hα) emission from the CGM of nearby galaxies. It is deployed on the 2.4 m Hiltner telescope at the MDM Observatory in Arizona.
Operated the 2.4-meter telescope with CHaS attached. Assisted in observing targets for the CHaS science campaign. Assisted with the repair and adjustment of the critical equipment of the spectrograph.

Observing and Field Experience

1. MDM, Kitt Peak National Observatory, Hiltner, 2.4 m (12 nights) (2024)
2. Raymond E. White Jr. 21-inch Telescope at Steward Observatory (14 nights) (2024)
3. MDM, Kitt Peak National Observatory, Hiltner, 2.4 m (5 nights) (2023)
4. FIREBall-2 flight Campaign and launch at NASA Columbia Scientific Balloon Facility (2023)
5. Raymond E. White Jr. 21-inch Telescope at Steward Observatory (29 nights) (2023)
6. Kitt Peak National Observatory, MDM, McGraw, 1.3 m (3 nights) (2022)
7. Kitt Peak National Observatory, MDM, Hiltner, 2.4 m (5 nights) (2022)
8. FIREBall-2 flight campaign at NASA Columbia Scientific Balloon Facility, NM (2022)
9. Raymond E. White Jr. 21-inch Telescope at Steward Observatory (12 nights) (2022)
10. Kuiper 61-inch Telescope at Steward Observatory (5 nights) (2022)

OUTREACH AND VOLUNTEER

1. California Dark Sky Festival Panamint Valley (2026)
2. Death Valley Dark Sky Festival NPS (2026)
3. California Dark Sky Festival Panamint Valley (2025)
4. Caltech Center for Teaching, Learning, & Outreach (CTLO) Elementary school science fairs (2026)
5. The University of Arizona Astronomy Club Elementary School Outreach (2022)
6. Buehler Planetarium Outreach Coordinator (2021)
7. Phi Theta Kappa Honor Society, Mumu Chapter President (2021)
8. Board of European Students of Technology (NGO) International Design Department (2019)
9. Technology Certificate Program from Politecnico di Milano on building life on Mars (2018)
10. High School Engineering Competition Main Organizer (2018)
11. Animal Rights Fundraiser Coordinator (2018)

SKILLS

Programming: Python (astropy, numpy, matplotlib, Pandas, photoutils), Linux, Bash, LaTeX; **Mechanical Design (CAD) Software:** Solidworks CAD **Major astronomical packages:** IRAF, SAOImageDS9, AstroImagej, Sharpcap **Optical Metrology:** Testing optical and optomechanical systems using Interferometery and meteorology grade 3D Scanners

AWARDS AND HONORS

1. Caltech FUTURE of Physics Program (2023) by the California Institute of Technology, the Division of Physics, Mathematics and Astronomy
2. Miriam Kleiman Scholarship (2023) by the University of Arizona, College of Science
3. Margaret Bilson Scholarship (2023) by the University of Arizona, College of Science
4. Niels and Anna Thompson Award in Physics (2023) by the University of Arizona, Physics Department
5. Global Wildcat Tuition Award (2021) by the University of Arizona
6. Global Academic Excellence Award (2021) by the University of Arizona
7. Dean's List (2020) by Broward College

PUBLICATIONS

1. "Investigating High-Dispersion HII Regions in the Disk of NGC 7331 with the Circumgalactic Hα Spectrograph", **Nazende I. Kerkeser**, et al. [ApJ 2026]
2. "Characterization and testing of a cross-delay line microchannel plate detector for the Aspera SmallSat mission", ..., **Nazende Ipek Kerkeser**, et al., UV, X-Ray, and Gamma-Ray Space Instrumentation 2025 [SPIE Proceeding, presentation + paper]
3. "Pioneering far UV emission mapping of the circumgalactic medium with Aspera—motivation, mission status, and lessons learned", CJ Vargas, ..., **Nazende Ipek Kerkeser**, et al., J. Astron. Telesc. Instrum. Syst. 11(4) 042216 (17 July 2025) [SPIE JATIS Article]
4. "Comprehensive detector test platform with precision thermal control for noise characterization of charge-coupled devices", Aafaque R. Khan, ..., **Nazende Ipek Kerkeser**, et al., J. Astron. Telesc. Instrum. Syst. 11(4) 042204 (12 June 2025) [SPIE JATIS Article]
5. "Alignment and performance verification of two-mirror focal corrector optics using computer-generated holograms for balloon-borne ultraviolet Telescope FIREBall-2", Simran Agarwal, ..., **Nazende Ipek Kerkeser**, et al., J. Astron. Telesc. Instrum. Syst. 11(2) 025003 (20 April 2025) [SPIE JATIS Article]
6. "Aspera payload design overview: UV SmallSat mission to detect and map warm-hot halo gas around the nearby galaxies", Haeun Chung, ..., **Nazende Ipek Kerkeser**, et al., Proc. SPIE 13093, Space Telescopes and Instrumentation 2024: Ultraviolet to Gamma Ray, 1309302 (21 August 2024) [SPIE Proceeding, presentation + paper]

7. "The Faint Intergalactic-medium Redshifted Emission Balloon (FIREBall-2)", Drew M. Miles, ..., **Nazende Kerkeser**, et al., Proc. SPIE 13093, Space Telescopes and Instrumentation 2024: Ultraviolet to Gamma Ray, 1309303 (22 August 2024) [SPIE Proceeding, presentation]
8. "Contamination Control for the Aspera FUV SmallSat", Nicole Melso, ..., **Ipek Kerkeser**, et al., SPIE Space Telescopes and Instrumentation 2024 [SPIE Proceeding, poster + paper]
9. "Optical alignment of contamination-sensitive Far-Ultraviolet spectrographs for Aspera SmallSat mission", Aafaque R. Khan, ..., **Ipek Kerkeser**, et al. [SPIE Proceeding, presentation + paper]
10. "Realignment and performance verification of two-mirror focal corrector optics for FIREBall-2 using computer generated hologram (CGH)", Simran Agarwal, ..., **Ipek Kerkeser**, et al. [SPIE Proceeding, poster + paper]
11. "An overview of the on-ground and in-orbit calibration of Far-Ultraviolet Spectrographs for the Aspera SmallSat", Aafaque R. Khan, ..., **Ipek Kerkeser**, et al. [SPIE Proceeding, poster]
12. "Advancing Ultraviolet Detector Technology for future missions: investigating the dark current plateau in silicon detectors using photon-counting EMCCDs", Aafaque R. Khan, ..., **Ipek Kerkeser**, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13093-26 [SPIE Proceeding, presentation + paper]
13. "Stacks, maps, and all that CHaS: refined image processing methods to map the nearby universe with the Circumgalactic H-Alpha Spectrograph", Ignacio Cevallos-Aleman, David Schiminovich Columbia, Meghna Sitaram, Nicole Melso, Barbara Cruvinel Santiago, **Nazende I. Kerkeser**, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13096-156 [SPIE Proceeding, poster + paper]
14. "Blue Notes of CHaS: An OIII/H-beta Channel for the Circumgalactic H-alpha Spectrograph + Other Instrument Upgrades", Meghna Sitaram, David Schiminovich, Ignacio Cevallos-Aleman, Nicole Melso, Bárbara Cruvinel Santiago, Brian Smiley, Skylar Bogdanowitsch, **Nazende I. Kerkeser**, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13096-154 [SPIE Proceeding, poster + paper]
15. "The Sky is Not the Limit: My Undergraduate Experience with FIREBall-2's Multinational Team", **Kerkeser, Nazende**, et al., 2024 [APS CUWIP Biosphere-2]
16. "Using HII regions in NGC7331 for flux calibration of the Circumgalactic Hα Spectrograph", **Kerkeser, Nazende**, et al., 2024 [AAS 243, poster]
17. "FIREBall-2 UV balloon telescope in-flight calibration system", Jessica Li, **Nazende I. Kerkeser**, et al. 2024 [SPIE JATIS Article]
18. "Quantum Efficiency Measurement for UV Detector Development", Bradley, Harrison, **Kerkeser, Nazende**, et al., 2023 [AAS 241, poster]
19. "Automation of Quantum Efficiency Measurement for CCD/EMCCD Detectors Using an API", Jones, Olivia, **Kerkeser, Nazende**, et al., 2023 [AAS 241, poster]

20. "FIREBall-2: The Faint Intergalactic-medium Redshifted Emission Balloon", Miles, Drew M, ..., **Kerkeser, Nazende**, et al., 2023 [AAS 241, poster]
21. "Balloon-borne FIREBall-2 ultraviolet spectrograph stray light control based on nonsequential reverse modeling of on-sky data", Trenton Brendel, ..., **Naz Ipek Kerkeser**, et al., J. Astron. Telesc. Instrum. Syst. 8(4) 048001, 25 November 2022 [SPIE JATIS Article]