

# Nazende ipek Kerkeser

---

University of Arizona  
Steward Observatory  
933 N Cherry Ave  
Tucson, AZ 85719 USA

nkerkeser@arizona.edu  
ORCID | LinkedIn

## EDUCATION

**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

### **Research Technologist, 2024-Present**

*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; see Current Research for details.

### **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 RESEARCH

### 1. 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.

### 2. 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.

### 3. 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.

### 4. The Circumgalactic H $\alpha$ Spectrograph (CH $\alpha$ S)

*Department of Astronomy, Columbia University, Advisor: Prof. David Schiminovich and Dr. Nicole Melso*

CH $\alpha$ S is an Integral Field Unit (IFU) spectrograph designed to detect faint H-Alpha (H $\alpha$ ) 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 CH $\alpha$ S attached. Assisted in observing targets for the CH $\alpha$ S 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 - In Progress) (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. The University of Arizona Astronomy Club Elementary School Outreach (2022)
2. Buehler Planetarium Outreach Coordinator (2021)
3. Phi Theta Kappa Honor Society, Mumu Chapter President (2021)
4. Board Of European Students of Technology (NGO) International Design Department (2019)
5. Technology Certificate Program from Politecnico di Milano on building life on Mars (2018)
6. High School Engineering Competition Main Organizer (2018)
7. Animal Rights Fundraiser Coordinator (2018)

## SKILLS

**Programming:** Python (astropy, numpy, matplotlib, Pandas, photutils), Linux, Bash, LaTeX; **Mechanical Design (CAD) Software:** Solidworks CAD **Major astronomical packages:** IRAF, SAOImageDS9, AstroImagej, Sharpcap **Optical Metrology:** Testing optical and optomechanical systems using Interferometry 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 H $\alpha$  Spectrograph”, **Nazende I. Kerkese**r, et al. [In prep, expected January 2025]
2. “FIREBall-2 UV balloon telescope in-flight calibration system”, Jessica Li, **Nazende I. Kerkese**r, et al.; [SPIE JATIS Article]
3. ”Aspera payload design overview: UV SmallSat mission to detect and map warm-hot halo gas around the nearby galaxies”, Haeun Chung, ..., **Nazende Ipek Kerkese**r, et al., Proc. SPIE 13093, Space Telescopes and Instrumentation 2024: Ultraviolet to Gamma Ray, 1309302 (21 August 2024) [SPIE Proceeding, submitted]
4. ”The Faint Intergalactic-medium Redshifted Emission Balloon (FIREBall-2)”, Drew M. Miles, ..., **Nazende Kerkese**r, et al., Proc. SPIE 13093, Space Telescopes and Instrumentation 2024: Ultraviolet to Gamma Ray, 1309303 (22 August 2024) [SPIE Proceeding, submitted]
5. “Contamination Control for the Aspera FUV SmallSat”, Nicole Melso, ..., **Ipek Kerkese**r, et al., SPIE Space Telescopes and Instrumentation 2024, [SPIE Proceeding, submitted]
6. “Optical alignment of contamination-sensitive Far-Ultraviolet spectrographs for Aspera SmallSat mission”, Aafaque R. Khan, ..., **Ipek Kerkese**r, et al., [SPIE Proceeding, submitted]
7. “Realignment and performance verification of two-mirror focal corrector optics for FIREBall-2 using computer generated hologram (CGH)”, Simran Agarwal, ..., **Ipek Kerkese**r, et al., [SPIE Proceeding, submitted]
8. “An overview of the on-ground and in-orbit calibration of Far-Ultraviolet Spectrographs for the Aspera SmallSat”, Aafaque R. Khan, ..., **Ipek Kerkese**r, et al., [SPIE Proceeding, submitted]
9. “Advancing Ultraviolet Detector Technology for future missions: investigating the dark current plateau in silicon detectors using photon-counting EMCCDs”, Aafaque R. Khan, ..., **Ipek Kerkese**r, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13093-26 [SPIE Proceeding, submitted]
10. “FIREBall-2(023): the 2023 flight of the Faint Intergalactic-medium Redshifted Emission Balloon”, Drew M. Miles, ..., **Nazende Kerkese**r, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13093-2 [SPIE Proceeding, submitted]
11. “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. Kerkese**r, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13096-156 [SPIE Proceeding, submitted]
12. “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. Kerkese**r, et al., SPIE Space Telescopes and Instrumentation 2024, Paper 13096-154 [SPIE Proceeding, submitted]

13. "FIREBall-2 UV balloon telescope in-flight calibration system", Jessica S. Li, **Nazende I. Kerkeser**, Aafaque R. Khan, Simran Agarwal, Erika T. Hamden, David Schimionovich, ... Proc. SPIE 12678, UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy 2023 [SPIE Proceeding, submitted]
14. "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]

## POSTERS

1. "The Sky is Not the Limit: My Undergraduate Experience with FIREBall-2's Multinational Team", **Kerkeser, Nazende**, et al., APS CUWIP Biosphere-2, 2024
2. "Using HII regions in NGC7331 for flux calibration of the Circumgalactic H $\alpha$  Spectrograph", **Kerkeser, Nazende**, et al., American Astronomical Society Meeting 243, 2024
3. "Quantum Efficiency Measurement for UV Detector Development", Bradley, Harrison, **Kerkeser, Nazende**, et al., American Astronomical Society Meeting 241, 2023
4. "Automation of Quantum Efficiency Measurement for CCD/EMCCD Detectors Using an API", Jones, Olivia, **Kerkeser, Nazende**, et al., American Astronomical Society Meeting 241, 2023
5. "FIREBall-2: The Faint Intergalactic-medium Redshifted Emission Balloon", Miles, Drew M, ..., **Kerkeser, Nazende**, et al., American Astronomical Society Meeting 241, 2023