

Arshia Akhtarkavan

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EDUCATION

2023 – Expected 2027 Bachelor of Science, **University of Arizona**, Tucson, AZ (GPA: 4.0/4.0)
W.A. Franke Honors College
Majors: Physics, Mathematics (Comprehensive Emphasis), & Astronomy
2022 – 2023 Diploma, **Saba International High School**, Frankfurt, Germany
2020 – 2022 High School, **The Atomic Energy Institute**, Tehran, Iran

RESEARCH AND WORK EXPERIENCE

Undergraduate Researcher in Astronomy Nov 2023 – Present

Steward Observatory, University of Arizona (Advisor: Prof. Egami)

- Development of software for forward-modeling of galaxy kinematics
- Processed incoming imaging and spectroscopic JWST data
- Conducted research on high-redshift galaxies using JWST NIRCcam imaging and grism spectroscopy
- Designed and trained deep learning models to help in identifying and resolving conflicts in JWST data
- Identified and analyzed transient and variable sources in JWST survey data
- Worked full-time during summer and winter breaks and part-time during the academic year

Dorrit Hoffleit Research Scholar June – August 2026

Yale University (Advisor: Prof. Geha & Prof. Bellinger)

- Conducted research on RR Lyrae stars in the Draco dwarf galaxy using spectroscopic and photometric survey data.
- Developed Bayesian statistical methods to measure stellar radial velocities and estimate distances.
- Applied stellar-evolution modeling to study the physical properties of pulsating stars.

Grader, Mathematics Department Aug 2025 – May 2026

Mathematics Department, University of Arizona, Tucson, AZ

- Graded weekly problem sets and quizzes for upper-division mathematics courses (MATH 454: ODEs and Stability Theory; MATH 313: Introduction to Linear Algebra)
- Wrote detailed solution manuals for homework assignments and quizzes
- Graded midterm examinations with written feedback emphasizing mathematical rigor and clarity
- Identified common conceptual errors and collaborated with instructors to address them

Research in Mathematical Physics October 2024 – April 2026

Mathematics Department, University of Arizona (Advisor: Prof. Cherkis)

[Islands Project](#)

- Conducted independent research on Nahm equations, constructing new and higher-order solutions
- Rebuilt the Islands Project website to support student engagement in mathematical physics research
- Recipient of RII Undergraduate Research Award supporting this project

Internship in a Mechanical Engineering Workshop Jan – Mar 2023

FH Aachen University, Essen, Germany

- Gained expertise in operating basic machinery and learned practical skills in a workshop setting.
- Developed the ability to interpret and create schematics and diagrams.
- Acquired hands-on experience in using various tools and equipment for different tasks (calipers, lathes, saws, column drills, milling machines, hand tools, bench vices, etc.).

PUBLICATIONS

1. The First Photometric Evidence of a Transient/Variable Source at $z > 5$ with JWST
DeCoursey C., Egami E., Sun F., **Akhtarkavan A.**, et al. (2025; [arXiv:2504.17007](#)).
2. Slitless Areal Pure-Parallel High-Redshift Emission Survey (SAPPHIRES): Early Data Release of Deep JWST/NIRCam Images and Spectra in MACS J0416 Parallel Field
Sun F., Fudamoto Y., Lin X., Helton J. M., Hsiao T. Y-Y., Egami E., **Akhtarkavan A.**, et al. (2025; [arXiv:2503.15587](#)).
3. Discovery of 39 Transients/Variables ($z_{\text{host}} = 0.437\text{--}5.271$) in GOODS-N using JADES and CONGRESS JWST/NIRCam Images
DeCoursey C., Egami E., Sun F., **Akhtarkavan A.**, et al. (2024; [Transient Name Server AstroNote](#)).

CONFERENCES AND WORKSHOPS

1. **“Forward-Modeling Galaxy Kinematics and Morphology with JWST NIRCam Grisms”**
Poster presentation, *Surveying the Universe in 4D: Beating Cosmic Variance with Wide-Field Slitless Spectroscopy from HST, JWST, Euclid, Roman, and Beyond* Workshop
Space Telescope Science Institute (STScI), Baltimore, MD, August 2026 (planned)
2. **“Modeling RR Lyrae Spectra in the Draco Dwarf Galaxy”**
Contributed Talk, *Yale/CeNAM Nuclear Asteroseismology Workshop*
Yale University, New Haven, CT, July 2026
3. **“Modeling RR Lyrae Spectra in the Draco Dwarf Galaxy”**
Contributed Talk, *Summer Research Symposium*
Yale University, New Haven, CT, July 2026
4. **“Islands Project and the Nahm Equations”**
Talk, *Third Annual Cross-Campus Undergraduate Research Forum and Questionnaire*
University of Arizona, Tucson, AZ, April 2026
5. **“Forward-Modeling Emission-Line Galaxy Kinematics and Morphology with JWST NIRCam Grisms”**
Contributed Talk, *Steward Observatory Internal Symposium*
Steward Observatory, University of Arizona, Tucson, AZ, March 2026
6. *Arizona Winter School on Multi-Probe Cosmology in the Roman ST Era*
Arizona Cosmology Lab, University of Arizona, Tucson, AZ, January 2026
7. **“Forward-Modeling Emission Line Galaxy Kinematics and Morphology with JWST NIRCam Grisms”**
iPoster presentation, *247th Meeting of the American Astronomical Society (AAS 247)*
Phoenix, AZ, January 2026

AWARDS AND SCHOLARSHIPS

Dorrit Hoffleit Research Scholarship, Yale University (2026)
William F. Lucas Astronomy Scholarship, Steward Observatory (2026)
College of Science Galileo Circle Scholar (Mathematics), University of Arizona (2026)
College of Science Galileo Circle Scholar (Physics), University of Arizona (2026)
Weaver Award for Undergraduate Research (2026)
Kenneth S. Krane Physics Scholarship (2025)
Evelyn O. Bychinsky Promising Astronomer Award (2025)
RII-Sponsored Campuswide Undergraduate Student-Initiated Original Research (2025)
Glenn C. Purviance Scholarship in Physics (2023)
Academic Year Highest Academic Distinction (2023 – Present)
Dean’s List with Distinction - Full Time (2023 – Present)
Global Wildcat Tuition Award, University of Arizona (2023 – Present)
Silver Medal, National Astronomy and Astrophysics Olympiad (2022)

SKILLS

Programming Languages	Python, C/C++, SQL
Scientific & Data Analysis Libraries (Python)	NumPy, Matplotlib, PyTorch, Astropy, SciPy, Specutils, Photutils, Pandas, JAX
Astronomy & Astrophysics Software	DS9, JWST Pipeline, Source detection and Photometry, Webbpsf, NIRCcam imaging and grism spectroscopy
Software & Research Systems	Linux/Unix, Git/GitHub, HPC environments, remote computing (ssh), GPU-accelerated computing (CUDA), Jupyter, VS Code, Emacs, LaTeX, Microsoft Office
Concepts	Data Processing Pipelines, Scientific Computing, Machine Learning, Numerical Methods

LANGUAGES

English	Fluent
Farsi (Persian)	Native
German	B1 level
Mandarin Chinese	Currently learning