

# Arshia Akhtarkavan

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## WORK EXPERIENCE

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### Undergraduate Researcher in Astronomy

Nov 2023 – Present

*Steward Observatory, University of Arizona, Tucson, AZ*

- Processed incoming imaging and spectroscopic JWST data
- Conducted research on high-redshift galaxies using JWST NIRCам imaging and grism spectroscopy
- Identified and analyzed transient and variable sources in JWST survey data
- Contributed to the development of software for forward-modeling of galaxy kinematics
- Simulated JWST data for the training of machine learning models
- Worked full-time during summer and winter breaks and part-time during the academic year

### Grader, MATH 454 – ODEs and Stability Theory

Aug – Dec 2025

*Mathematics Department, University of Arizona, Tucson, AZ*

- Graded weekly problem sets and quizzes for an upper-division mathematics course
- Wrote detailed solution manuals for homework assignments and quizzes
- Graded midterm examinations with written feedback emphasizing mathematical rigor and clarity
- Identified common conceptual errors on exams and worked closely with the professor to address them in lectures

### 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.).

## PROJECTS

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### Research in Mathematical Physics

[Islands Website](#)

Performed research on the Nahm equations, focusing on constructing higher-order solutions and eventually generating an entirely new set of solutions. In parallel, rebuilt and expanded the Islands Project website after it had gone offline. This website serves as not only a central hub for the project but also as a starting point for students at different levels to get involved in theoretical/mathematical physics research.

## EDUCATION

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

# PUBLICATIONS

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1. The First Photometric Evidence of a Transient/Variable Source at  $z > 5$  with JWST DeCoursey C, Egami E, Sun F, **A. Akhtarkavan**, et al. (2025).

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).

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).

# CONFERENCE PRESENTATION

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1. **Forward-Modeling Emission Line Galaxy Kinematics and Morphology with JWST NIR-Cam Grisms.**  
iposter presentation, 247th Meeting of the American Astronomical Society (AAS 247), January 2026

2. **Recreating the Islands project and Its Role in Mathematical Physics Research**  
Talk and Seminar, University of Arizona, April 2026

# SKILLS

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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, NIRCam 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, WordPress, Microsoft Office

# AWARDS AND SCHOLARSHIPS

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2025-2026	Kenneth S. Krane Physics Scholarship
2025-2026	Evelyn O. Bychinsky Promising Astronomer Award
2025-2026	RII-Sponsored Campuswide Undergraduate Student-Initiated Original Research
2023-2024	Glenn C. Purviance Scholarship in Physics
2023-2024	Academic Year Highest Academic Distinction
2023-Present	Dean's List with Distinction - Full Time
2023-Present	Global Wildcat Tuition Award, University of Arizona
2022	Silver Medal, National Astronomy and Astrophysics Olympiad

# LANGUAGES

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