

NATHAN C. SHAW

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EDUCATION & PROFESSIONAL EXPERIENCE

B.S. Physics, Astrophysics Track | Truman State University, Kirksville, MO May 2025

- Honors: Magna Cum Laude, GPA: 3.84/4.0
- Minors: Mathematics, STEM Research

Postbaccalaureate Research Student | University of Kansas, Lawrence, KS Present

RESEARCH INTERESTS & SKILLS

Research Interests: AGN, H₂O Megamasers, Observational Cosmology, High-Redshift Galaxies, and Dust

Technical Skills: Non-parametric Measurements (Gini, M20), PhotoUtils, Cutout2D, StatMorph, DS9, Python, Scipy, Astropy, IDL, LaTeX, Data Analysis, Disk-fitting Models, Aperture Photometry, and AstroImageJ

Collaborations: Member of the MEGA collaboration with access to JWST MIRI observations

RESEARCH EXPERIENCE

Illuminating the Obscured: Non-Parametric Morphologies of MEGA Galaxies at Cosmic Noon

University of Kansas, Lawrence, KS Fall 2025 – Present

Mentor: Dr. Allison Kirkpatrick

- Measure the spatial distribution of dust and obscured star formation in galaxies at $z \sim 1 - 2$ using JWST/MIRI observations from the MEGA survey
- Write code to handle FITS files, generate galaxy cutouts from survey mosaics, create segmentation maps for image cutouts, and use StatMorph to extract galaxy morphological parameters

Observing and Analyzing Exoplanet Transits for the TESS Follow-Up Observing Program

Truman State University, Kirksville, MO Fall 2022 – Spring 2025

Mentor: Dr. Vayujeet Gokhale

- Observed candidate exoplanet transits using 31 and 42-inch telescopes at the National Undergraduate Research Observatory (NURO) in Flagstaff, AZ, and submitted the transit data for the TESS Follow-Up Observing Program (TFOP)
- Results: 26 Exoplanet transits detected and analyzed, 9 submitted to TFOP

The Quest For 3%: Strategies to Improve H_0 Precision with the Megamaser Cosmology Project

National Radio Astronomy Observatory, Charlottesville, VA Summer 2024

Mentor: Dr. James Braatz

- Demonstrated feasibility of achieving a 3% Hubble constant measurement using megamaser data
- Results: New observations of the megamaser systems in NGC 6323 and NGC 5765b are needed to improve the uncertainty to 3.1%

PRESENTATIONS

Illuminating the Obscured: Non-Parametric Morphologies of MEGA Galaxies at Cosmic Noon

- American Astronomical Society Meeting 247, Phoenix AZ Jan 2026

The Quest for 3%: Strategies to Improve H_0 Precision with the Megamaser Cosmology Project

- Truman State Student Research Conference, Kirksville MO Apr 2025
- APS Prairie Section Spring Meeting, Romeoville IL Feb 2025
- American Astronomical Society Meeting 245, National Harbor MD Jan 2025
- Mid-America Regional Astrophysics Conference, Lawrence KS Dec 2024
- National Radio Astronomy Observatory Student Symposium, Charlottesville VA Aug 2024

Observing and Analyzing Exoplanet Transits for the TESS Follow-UP Observing Program

- 2024 NASA Missouri Space Grant Consortium, Rolla MO Apr 2024
- 2023 NASA Missouri Space Grant Consortium, Rolla MO Apr 2023
- Truman State Student Research Conference, Kirksville MO Apr 2023

PUBLICATIONS

1. **Illuminating the Obscured: Non-Parametric Morphologies of MEGA Galaxies at Cosmic Noon**
Shaw, N.; Kirkpatrick, A.; Troiani, G. | *in prep., anticipated Spring 2026*
2. **A JWST MIRI-MRS Map of the Nucleus of the Nearby Starburst Galaxy NGC 253**
Siwakoti, U.; et al. *incl. Shaw, N. | in prep., anticipated Spring 2026*
3. **A Young Superbubble in NGC 253's Central Starburst**
Sheriff, K.; et al. *incl. Shaw, N. | in prep., anticipated Spring 2026*
4. **The Quest for 3%: The Next Milestone in the Megamaser Cosmology Project**
Shaw, N.; Braatz, J. | *Proceedings of the 2024 NRAO/GBO Summer Student Program, Dec 2024*

AWARDS

Outstanding Undergraduate Student in Physics Truman State	Spring 2025
Chambliss Award Recipient 245th American Astronomical Society Meeting	Winter 2025
Sigma Pi Sigma Physics and Astronomy Honor Society	Inducted Spring 2024
Truman State STEP Scholars	STEM Talent Expansion Program
President's List Truman State	Fall 2021, Spring 2023, Fall 2024, Spring 2025
Vice President of Academic Affairs List Truman State	Spring 2022, Fall 2022, Fall 2023, Spring 2024

GRADUATE COURSEWORK

ASTR 797 – Galaxies University of Kansas	Spring 2025
ASTR 796 – Applied Physics of the Interstellar Medium University of Kansas	Fall 2025

TEACHING EXPERIENCE

Mad Science Instructor	Aug 2025 – Present
<i>Mad Science– Greater Kansas City, Lawrence KS</i>	
– Lead after-school programs, perform educational shows, and represent the organization at community outreach events for elementary students across Kansas City	
Del and Norma Robison Planetarium Student Presenter	Jan 2024 – May 2025
<i>Truman State University, Kirksville MO</i>	
– Developed, wrote, and coded my own shows covering themes such as the current night sky, eclipses, and the solar system	
Observatory Manager/Astronomy Lab Teaching Assistant	Aug 2023 – May 2025
<i>Truman State University, Kirksville MO</i>	
– Assisted with astronomy lab setup	
– Planned and operated the telescopes/observatory during open-house events	
– Managed regular upkeep of observatory equipment including 17-inch CDK Planewave telescope	
Physics/Astronomy Tutor	Aug 2022 – May 2025
<i>Truman State University, Kirksville MO</i>	
Science on Saturdays Instructor	Aug 2023 – May 2025
<i>Truman State University, Kirksville MO</i>	

ESY Specialized Teaching Assistant

June 2023

Tiffany Ridge Elementary School, Kansas City MO

- Worked one-on-one with elementary-aged nonverbal special education students in a self-contained classroom

OUTREACH & VOLUNTEERING

University of Kansas – Public Telescope Nights Fall 2025 – Present

Truman State Astronomy/Dark Sky Outreach Fall 2022 – Spring 2025

- Organized 10-15 stargazing events per semester around Truman's campus
- Presented Dark Sky information at events around Kirksville during International Dark Sky Week

Truman State Science Olympiad Volunteer Annually 2022 – 2025

- Proctored and wrote exams in meteorology and astronomy for middle and high school students

Science on Saturdays Instructor Fall 2023 – Spring 2025

- Presented 20-minute planetarium shows for K-5 students exploring the Solar System

Dark Skies Bright Kids Summer 2024

- Presented inflatable planetarium shows to Nathanael Greene Primary School

McCormick Observatory Public Nights Summer 2024

Astronomy Festival on the National Mall Summer 2024

- Staffed NRAO's booth

Great North American Eclipse Series Spring 2024

- Led weekly solar eclipse outreach ahead of the 2024 event and was featured in a KTVO news segment

Girl Scout Space Science Night Spring 2024

- Organized and led a space science badge night for two Girl Scout age groups featuring planetarium shows, telescope observing, and hands-on activities

LEADERSHIP & EXTRACURRICULARS

Society of Physics Students Fall 2021 – Spring 2025

- *President* (Fall 2024 – Spring 2025) – *Vice President* (Fall 2023 – Spring 2024)
- Presided over bi-weekly meetings, managed the executive board, and led outreach efforts within the department
- Managed daily tutoring operations within the physics department

Phi Mu Alpha Music Fraternity Fall 2022 – Spring 2025

- *Warden* (Fall 2024 – Spring 2025) – *Activities Director* (Fall 2023 – Spring 2024)
- Planned impactful activities and recitals to foster growth and bonds within the community

Truman State Saxophone Studio Fall 2023 – Spring 2025

- *Music Arranger / Member*

Statesmen Marching Band Fall 2021 – Fall 2024

- *Section Leader* (Fall 2022 – Fall 2024) – *Member* (Fall 2021)