Joseph Havens

UNDERGRADUATE RESEARCH ASSISTANT

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EDUCATION

Bachelor of Science in Physics and Astronomy, Minor in German
Expected Graduation: May 2027

RESEARCH EXPERIENCE

Undergraduate Research Assistant February 2023-August 2024
University of Kansas Advisor: Dr. Steven Prohira, Dr. Alex Kyriacou (Postdoc under Dr. Steven Prohira)
Goal: Built, ran, and analyzed simulations of radio wave propagation through a medium of ice with a changing index of refraction.
Utilized ParaPropPython (proprietary Parabolic Equation simulation), MEEP (FDTD computational electromagnetic simulation), and ray tracing to compare and analyze various simulation methods for radio wave propagation.

Undergraduate Research Assistant December 2024-February 2025
University of Kansas Advisor: Greg Troiani (Graduate student under Dr. Allison Kirkpatrick)
Goal: Contributing to and refining the research team's Zooniverse site
Utilize TRILOGY (proprietary image conversion software) to prepare .fits files for submission to the Zooniverse site

Undergraduate Research Assistant February 2025-Present
University of Kansas Advisor: Dr. Bren Backhaus (Postdoc Fellow under Dr. Allison Kirkpatrick)
Goal: Analyzing and classifying Spectra from SMACS and JADES to describe dust attenuation relations as it affects a source's luminosity using multi-line attenuation modeling

CERTIFICATIONS AND AWARDS

Awards
Eagle Scout - June 2020, 5 Eagle Scout Palms

2x Letterman and selected for state team in Scholars' Bowl

32 superscore ACT

COURSEWORK

Observational Astrophysics-ASTR 596   Fall 2023
Projects: Utilized the Breyo Observatory at Sienna College in Loudonville, NY for remote sky imaging
Skills: Demonstrated hands-on skills in operating astronomical equipment and conducting observations
Processed and reduced observational data, showcasing data analysis skills

Galactic and Extragalactic Astronomy-ASTR 592   Spring 2024
Skills: Gained a deep understanding of the structure and dynamics of galaxies.
Improved knowledge of galaxy formation, evolution, and interaction processes.

Strengthened skills in statistical analysis and numerical simulations relevant to galactic astronomy.

Astrophysics I-ASTR 691   Fall 2024
Skills: Explored the physical principles underlying key astrophysical phenomena
Strengthened computational and analytical skills through problem-solving and project learning

Astrophysics II-ASTR 692   Spring 2025
Skills: Studied the deeper science behind much of what astronomy research is today. From Einstein Rings to Special and General Relativity and even cosmology, This was the final undergraduate class for Astronomy.

(Graduate) **Radiation and Interstellar Medium-ASTR 796**   Fall 2025
Projects: Class project with multiple groups including PAH/silicate lines in NGC 253
Title (WIP): A JWST MIRI-MRS Map of the Nucleus of the Nearby Starburst Galaxy NGC 253 by E.A.C. Mills et al
Skills: Graduate-level education in atomic transitions, emission lines, PAHs, IFUs, and more.

AFFILIATIONS
University of Kansas Men's Volleyball Club
          Actively participated in practices and tournaments, refining not only physical fitness and volleyball skills, but leadership, analysis, and quick decision making abilities.

Scouts BSA - Troop 249, Jayhawk Area Council
- Led a troop of 30+ scouts for three consecutive 6-month terms.
- Leadership Development: Refined leadership skills through hands-on practice, mentorship, and specialized training
- Team Management: Coordinated activities, delegated responsibilities, and fostered collaboration to enhance troop cohesion.
- Conflict Resolution: Effectively mediated disputes and maintained a positive, inclusive environment.
- Event Planning: Organized and executed large-scale events, including camping trips, service projects, and training programs.

WORK EXPERIENCE
National Youth Leadership Training (NYLT) staff - September 2018-May 2019
- Attended 6 months of in-depth, advanced leadership training courses
- After, mentored and taught younger scouts to lead successfully, effectively, and energetically
- Cultivated a positive, lighthearted atmosphere among the attendees and staff
- Cultivated attention, motivation, and passion for leadership in the attendees

SKILLS & ABILITIES
Programming Languages: Python (proficient), LaTeX (proficient), Arduino variant of C++ (intermediate), bash (beginner), MacOS Swift (beginner)

Data Analysis: Analyzing and synthesizing complex datasets

Machine Learning/AI: Developing machine learning models, leveraging AI for predictive analytics, automation and smart home accessories

Research Methodologies: Skilled in both quantitative and qualitative analysis

Astronomical Data Processing: Skilled in reducing and analyzing observational data