

Keaton Donaghue

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EDUCATION BACKGROUND

University of Kansas (KU)

Lawrence, Kansas

Bachelor of Science, Physics and Astronomy; Minor in Music

May 2024

3.78 Cumulative GPA

Honors College

HONORS AND AWARDS

University of Kansas (KU)

Lawrence, Kansas

Gene E Feaster Scholarship

Received May 2023 (Amount \$9550)

- Awarded to two to three physics or astronomy undergraduates who have shown outstanding academic achievement.
- Highest undergraduate physics award given by the department.

University of Kansas (KU)

Lawrence, Kansas

Barbara Anthony-Twarog Academic Support Award

Received May 2023 (Amount \$500)

- Awarded for efforts in outreach and inclusion

University of Kansas (KU)

Lawrence, Kansas

J.D. Stranathan Outstanding Student in Physics Scholarship

Received May 2022 (Amount \$2000)

- Awarded to two rising junior/senior level physics students in strong academic standing and who actively pursue research.

University of Kansas (KU)

Lawrence, Kansas

Sigma Pi Sigma member

Inducted April 2023

RESEARCH EXPERIENCE

University of Hawaii

Honolulu, Hawaii

REU in at the Institute for Astronomy with Dr. Gutcke and Dr. Shappee

May 2023-July 2023

- Used LYRA, the highest resolution cosmological hydrodynamical simulation to date, to analyze the $z=0$ gas morphology of the five current runs.
- Showed that current hydrodynamical simulations don't properly account for elements that have a significant secondary (metallicity dependent) formation component.
- manuscript in prep work to be presented at 243rd AAs meeting.

University of Kansas (KU)

Lawrence, Kansas

Undergraduate Researcher in Millimeter Astronomy with Dr. Mills

March. 2022-Present

- Used data collected by ALMA and the VLA, including some of the first high-resolution ALMA Band 9 data, to measure various properties of embedded star clusters in the central starburst of NGC 253.
- Presented all new Band 9 results of the dust temperature and size measurements of the star clusters at 241st AAS meeting.
- re-gridded and convolved data to have a common beam size for 5-point SED Fitting
- Writing a paper to be submitted to a peer-reviewed journal (Donaghue et al in prep)

PROFESSIONAL EXPERIENCE

Institute for Astronomy (IfA)
IfA REU Observing Experience

Honolulu, Hawaii
Summer 2023

- Sat in on a grad student's observing time of protoplanetary disks in the mid infrared
- Used Keck II/NIRSPEC+AO
- gained insight into how astronomical data is taken and how remote observing is used to operate scientific instruments

Society of Physics Students
Physcon 2022

Washington DC
Fall 2022

- Largest gathering of undergraduate physics and astronomy students
- attended professional development talks geared towards early career scientists

TALKS

University of Kansas Astro-Seminar
"LYRA 4: Merger-driven Gas Morphology of a Local Group Dwarf Analog"

Lawrence, Kansas
September 2023

Institute for Astronomy REU Research Symposium
"LYRA 4: Merger-driven Gas Morphology of a Local Group Dwarf Analog"

Honolulu, Hawaii
July 2023

University of Kansas Summer Student Research Symposium
"Multiwavelength Study of Clusters in the Central Starburst Region of NGC 253"

Lawrence, Kansas
August 2022

- Presented preliminary results of my multiwavelength study of NGC 253 to an audience of fellow undergraduates and research advisors

POSTERS

243rd Meeting of The American Astronomical Society
Summer 2023 IfA REU poster

New Orleans, Louisiana
January 2024

241st Meeting of The American Astronomical Society
"Radio and Sub-millimeter multiwavelength study of SSCs in NGC 253"

Seattle, Washington
January 2023

<https://aas241-aas.ipostersessions.com/?s=66-07-21-A4-FC-08-89-75-53-B8-90-DB-48-D7-E9-08>

LEADERSHIP EXPERIENCE

University of Kansas (KU)
Undergraduate Physics and Astronomy Ambassador

Lawrence, Kansas
Fall 2023-Present

- Wrote the job description after my initial proposal of the program was accepted
- Organized materials to be given to prospective students during visits such as pamphlets advertising faculty research
- Provided tours to prospective students and provided an undergraduate's perspective to being in the department

University of Kansas (KU)

Lawrence, Kansas

Undergraduate Physics Representative for the Department

Fall 2022-Present

- Served as a representative of the physics and astronomy undergraduate body in department meetings.
- Proposed the creation of the KU Physics and Astronomy Student Ambassador program
- Participated in the undergraduate committee meetings to develop policies pertaining to undergraduate course requirements and assisted in developing a course outlook plan for each course

University of Kansas (KU)

Lawrence, Kansas

Society of Physics Students KU Chapter President

May 2022-Present

- Organized and planned biweekly for the Society of Physics Students.
- organized and ran special sessions to advertise REUs and how to apply for students
- invited professors to come and speak about their research and how students can get involved.
- Organized and acquired funding for members to attend Physcon 2022 held in Washington D.C.
- Greatly increased student membership and participation by advertising social SPS events and conducting outreach in undergraduate classes.

OUTREACH

University of Kansas

Lawrence, Kansas

Carnival of Chemistry

November 2023

- Coordinated with the event coordinator to have SPS participate in the carnival of chemistry
- Ran the Van de Graaff generator station
- Requested and organized the use of the KU planetarium
- Coordinated the SPS stations at the event and ensured students knew how to explain their demos to youth typically in elementary and middle school.

University of Kansas

Lawrence, Kansas

Science in Drag

November 2023

- Helped organize physics demos from SPS for the Science in Drag fundraising event provided by organized by the SPS VP.

University of Kansas

Lawrence, Kansas

Hawkfest Planetarium Showcase

August 2023

- Helped run the front table for the KU Physics and Astronomy Planetarium.

Hillcrest Elementary School

Lawrence, Kansas

Hillcrest Elementary School Science Expo

April 2023

- Organized an SPS group to show off physics demos to elementary school students

Sunset Hill Elementary School

Lawrence, Kansas

Sunset Hill Elementary School Science Expo

April 2023

- Organized an SPS group to show off physics demos to elementary school students.

University of Kansas (KU)

Lawrence, Kansas

KU Carnival of Chemistry

November 2022

- Coordinated with the event coordinator to have SPS participate in the carnival of chemistry
- Requested and organized the demos used at the event.
- Coordinated the SPS stations at the event and ensured students knew how to explain their demos to youth typically in elementary and middle school.

Sunset Hill Elementary School

Lawrence, Kansas

Sunset Hill Elementary School Science Expo

April 2022

- Organized and ran simple physics computer demos that allowed elementary students to interact with physical systems.

TEACHING EXPERIENCE

University of Kansas (KU)

Modern Physics Teaching Assistant

Lawrence, Kansas

Spring 2023- Present

- Graded student assignments and provided feedback for improvement.
- assisted in proctoring exams
- held office hours to provide additional reinforcement of material taught in class through discussion and practice problems.

University of Kansas (KU)

Algebra Based Physics Teaching Assistant

Lawrence, Kansas

Fall 2022- Winter 2022

- Graded student assignments and provided feedback for improvement.
- Answered student's questions regarding homework problems

University of Kansas (KU)

Outside Physics Tutor

Lawrence, Kansas

Spring 2022- Fall 2022

- Worked as a private tutor for students in PHSX 114, PHSX 115, and occasionally PHSX 211.
- Provided additional reinforcement of material taught in class through further examples and helping students through their own thought process. Helped students achieve grades desired.

TECHNICAL SKILLS

- Extensive knowledge of Python and Python Packages including Numpy, pandas, and scipy.
- Extensive knowledge of astronomy-specific python packages including astropy and photutils.
- Extensive knowledge of reading and manipulating data from fits files.
- Knowledge of using DS9 to analyze fits images
- Knowledge of reading and manipulating data from data cubes.
- Knowledge of LaTeX formatting and writing in LaTeX as well as BibTex formatting.
- General knowledge of HTML
- Member of a KU Jazz combo, saxophone soloist
- Member of KU Jazz ensemble 2, Baritone saxophonist, Fall 2020-Fall 2021
- Member of KU Symphonic Band, Baritone saxophonist, Fall 2020-Fall 2021