

Keaton Donaghue

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EDUCATION BACKGROUND

University of Maryland (UMD)

Astronomy Graduate Student

College Park, Maryland

Aug. 2024 - Present

University of Kansas (KU)

Bachelor of Science, Physics and Astronomy; Minor in Music

Lawrence, Kansas

Aug. 2020 - May 2024

3.73 Cumulative GPA

Departmental Honors

HONORS AND AWARDS

National Science Foundation

NSF Graduate Research Fellowship

Awarded April 2024 (Amount per year \$37000)

University of Kansas (KU)

Gene E Feaster Scholarship

Lawrence, Kansas

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)

Barbara Anthony-Twarog Academic Support Award

Lawrence, Kansas

Received May 2023 (Amount \$500)

- Awarded for efforts in outreach and inclusion

University of Kansas (KU)

J.D. Stranathan Outstanding Student in Physics Scholarship

Lawrence, Kansas

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)

Sigma Pi Sigma member

Lawrence, Kansas

Inducted April 2023

RESEARCH EXPERIENCE

University of Hawaii

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

Honolulu, Hawaii

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.
- Work presented at 243rd AAs meeting.

University of Kansas (KU)

Undergraduate Researcher in Millimeter Astronomy with Dr. Mills

Lawrence, Kansas

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)

TALKS

University of Kansas Astro-Seminar Lawrence, Kansas
"LYRA 4: Merger-driven Gas Morphology of a Local Group Dwarf Analog" September 2023

Institute for Astronomy REU Research Symposium Honolulu, Hawaii
"LYRA 4: Merger-driven Gas Morphology of a Local Group Dwarf Analog" July 2023

University of Kansas Summer Student Research Symposium Lawrence, Kansas
"Multiwavelength Study of Clusters in the Central Starburst Region of NGC 253" August 2022

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

OBSERVING EXPERIENCE

Co-I ALMA Cycle 11 (2024)
"The Definitive View of M83's Center: Completing A Deep Parsec-Scale Survey of the Nearest Nuclei"

Co-I ALMA Cycle 11 (2024)
"Unveiling Embedded star formation and feedback in the prototypical merger-starburst VV 114"

University of Kansas (KU) Lawrence, Kansas
Observational Astrophysics class observing October 2023

- Used Breyo 0.7m Telescope at Siena College to observe two open clusters in the r and g bands using the Kepler K4040 Camera

Institute for Astronomy (IfA) Honolulu, Hawaii
IfA REU Observing Experience Summer 2023

- Sat in on a grad student's observing time of protoplanetary disks in the mid infrared
- Used Keck II/NIRSPEC+AO

POSTERS

243rd Meeting of The American Astronomical Society New Orleans, Louisiana
Summer 2023 IfA REU poster January 2024

Mid-American Regional Astrophysical Conference Atchison Kansas
"Optical Depth and Temperature of Dust Surrounding Massive Clusters in NGC 253" November 2023

241st Meeting of The American Astronomical Society Seattle, Washington

PROFESSIONAL EXPERIENCE

NRAO

Socorro, New Mexico

20th NRAO Synthesis Imaging Workshop

May 2024

- Workshop dedicated to learning about radio interferometry techniques through lectures and workshops
- Learned to use CASA to calibrate and image ALMA data

ALMA

Puerto Varas, Chile

ALMA at 10 years Conference

December 2023

- Conference celebrating the first decade of science from ALMA. Both looking back on past accomplishments and the future
- Attending talk sessions virtually

Society of Physics Students

Washington DC

Physcon 2022

Fall 2022

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

LEADERSHIP EXPERIENCE

University of Kansas (KU)

Lawrence, Kansas

Undergraduate Physics and Astronomy Ambassador

Aug. 2023 - May 2024

- 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

Aug. 2022 - May 2024

- 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 - May 2024

- Organized and planned biweekly meetings 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

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| University of Kansas
<i>KU Physics and Astronomy REU and JUST summer program</i> | Lawrence, Kansas
<i>July 2024</i> |
| <ul style="list-style-type: none">• Ran a three-hour applying to graduate school workshop for Undergraduate REU students and KU undergrads as an invited speaker. | |
| Hillcrest Elementary School
<i>Hillcrest Elementary School Science Expo</i> | Lawrence, Kansas
<i>May 2024</i> |
| <ul style="list-style-type: none">• Organized an SPS group to show off physics demos to elementary school students | |
| Sunset Hill Elementary School
<i>Sunset Hill Elementary School Science Expo</i> | Lawrence, Kansas
<i>April 2024</i> |
| <ul style="list-style-type: none">• Organized an SPS group to show off physics demos to elementary school students. | |
| University of Kansas
<i>KU Solar Eclipse Event</i> | Lawrence, Kansas
<i>April 2024</i> |
| <ul style="list-style-type: none">• Organized the largest KU Department of Physics and Astronomy public event in years to view the April solar eclipse• Hosted over 1000 people in our outdoor venue.• Organized speakers to give talks about astronomy to the public.• Coordinated volunteers to run the main booth, handing out eclipse glasses, and operating solar filter telescopes. | |
| University of Kansas
<i>Carnival of Chemistry</i> | Lawrence, Kansas
<i>November 2023</i> |
| <ul style="list-style-type: none">• 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
<i>Science in Drag</i> | Lawrence, Kansas
<i>November 2023</i> |
| <ul style="list-style-type: none">• Helped organize physics demos from SPS for the Science in Drag fundraising event provided by organized by the SPS VP. | |
| University of Kansas
<i>Hawkfest Planetarium Showcase</i> | Lawrence, Kansas
<i>August 2023</i> |
| <ul style="list-style-type: none">• Helped run the front table for the KU Physics and Astronomy Planetarium. | |
| Hillcrest Elementary School
<i>Hillcrest Elementary School Science Expo</i> | Lawrence, Kansas
<i>April 2023</i> |
| <ul style="list-style-type: none">• Organized an SPS group to show off physics demos to elementary school students | |
| Sunset Hill Elementary School
<i>Sunset Hill Elementary School Science Expo</i> | Lawrence, Kansas
<i>April 2023</i> |
| <ul style="list-style-type: none">• Organized an SPS group to show off physics demos to elementary school students. | |
| University of Kansas (KU)
<i>KU Carnival of Chemistry</i> | Lawrence, Kansas
<i>November 2022</i> |
| <ul style="list-style-type: none">• 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)

Lawrence, Kansas

ASTR 391: Physical Astronomy Honors Teaching Assistant

Spring 2024- May 2024

University of Kansas (KU)

Lawrence, Kansas

PHSX 313: Modern Physics Teaching Assistant

Spring 2023- Winter 2023

University of Kansas (KU)

Lawrence, Kansas

PHSX 114 Algebra Based Physics Teaching Assistant

Fall 2022- Winter 2022

University of Kansas (KU)

Lawrence, Kansas

Outside Physics Tutor

Spring 2022- Fall 2022

- Worked as a private tutor for students in PHSX 114, PHSX 115, and occasionally PHSX 211.

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 CASA and CARTA for imaging.
- 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