# Joshua B. Hill

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## Research Interests

Topics: Cosmology, Galaxy Formation, Galaxy-Halo Connection, Large Scale Structure, Dark Matter, Exoplanets, Astrometry.

Methods: Theoretical Modeling, Numerical Simulations, Machine Learning.

## Education

University of Utah • B.S., Physics with a Concentration in Astronomy and Astrophysics & Mathematics Minor • Spring 2024

## Honors and Awards

- Undergraduate Research Scholar • Spring 2024
- Paul Gilbert Outstanding Undergraduate Research Award in Astronomy and Astrophysics • Spring 2023
- Undergraduate Research Opportunity Program (UROP) • Spring 2022 and Fall 2022

## Publications

- **Joshua B. Hill**; Yao-Yuan Mao, 2024, *Explaining the Relationship Between Galaxy Sizes and their Spatial Distribution, in prep*
- Marc L. Whiting*; **Joshua B. Hill***; Benjamin Bromley; Scott Kenyon, 2023, *A Catalog of Nearby Accelerating Star Candidates in Gaia DR3*, Astronomical Journal, 14 pages, 6 figures, 3 tables. Catalog available with publication; doi:10.3847/1538-3881/acc526
  - *Co-First Authors

## Technical Skills

Coding languages and packages: Python, NumPy, Matplotlib, Pandas, database query (SQL), astropy, Scikit-learn, Maple, Latex

## Relevant Courses Taken

Notable upper-division and graduate cources I got an A in:

- Physics 3730, Computing in Physics I, Statistics, Linux command line, Python, Latex, Maple
- Physics 4410, Classical Physics I, *Stephan T. Thornton and Jerry B. Marion, Classical Dynamics of Particles and Systems, fifth edition*
- Physics 4420, Classical Physics II, *David J. Griffiths, Introduction to Electrodynamics, fourth edition*
- Physics 4080, Cosmology, *Barbara Ryden, Introduction to cosmology, second edition*
- Physics 4090, Stellar Astrophysics, *O. R. Pols, Stellar Structure and Evolution*
- Physics 4760, Thermal and Statistical Physics, *Daniel V. Schroeder, An Introduction to Thermal Physics*
- Physics 5210, Gravitation, *James B. Hartle, Gravity*
- Math 5010, Probability, *David F. Anderson, Timo Seppölöinen, and Benedeck Valkó, Introduction to Probability*
- Physics 5570, Galaxies, *Peter Schneider, Extragalactic Astronomy and Cosmology, second edition*

## Appointments and Research Experience

Undergraduate Research Student • Yao-Yuan Mao, University of Utah • Summer 2023 to Fall 2024

- Understanding a model that predict how Dark Matter Halos determine the half-light radius of galaxies.

Undergraduate Research Student • Ben Bromley, University of Utah • Spring 2022 to Spring 2023

- Used machine learning methods to create a catalog of accelerating stars. Collaboration was vital for the completion of this project.

## Conferences

- Attendee • Dark, Hot, Warm, and Fuzzy Matter In Space and Time (DHWFEST) at University of Utah • July 2024
- Speaker • Undergraduate Research Symposium • April 2024
- Poster Presenter • Center for Science and Mathematics Education (CSME) Symposium at University of Utah • April 2023
- Speaker • Utah Conference on Undergraduate Research, Contributed • February 2023

## Teaching Experience

*Teaching Assistant* • University of Utah, • Fall 2024
- Physics 3010, Intermediate Mechanics, *John R. Taylor, Classical Mechanics*, Graded Homework, Quizzes, and Labs, facilitate small group discussions, and hold office hours.

*Learning Assistant* • University of Utah • Spring 2023 and Spring 2024
- Physics 3010, Intermediate Mechanics, *John R. Taylor, Classical Mechanics*, Facilitate small group discussions, and hold office hours.

*Learning Assistant* • University of Utah • Fall 2023
- Astro 3070, Introduction to Astrophysics, *Barbara Ryden and Bradly M. Peterson, Introduction to Astrophysics*, Facilitate small group discussions, and hold office hours.