

JAKOB M. HELTON

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CURRENT POSITION

A first-year doctoral student and data scientist at the University of Arizona looking to make the switch from academia to industry; member of the James Webb Space Telescope Advanced Deep Extragalactic Survey (JADES); experienced in research, problem solving, statistical modeling, and machine learning.

EDUCATION

University of Arizona

Degree: M.S. and Ph.D. in Astronomy

August 2021 - Present

Departmental GPA: 4.00

Princeton University

Degree: B.A. in Astrophysical Sciences

September 2017 - May 2021

Departmental GPA: 3.76

PUBLICATIONS

4. **J. M. Helton**, A. I. Zabludoff, K. D. French, et al., *The spatially resolved star formation histories of post-starburst galaxies in SDSS-IV MaNGA*, in preparation.
 - Selected anomalous sources within a large sample of galaxies using integral field spectroscopy.
 - Applied stellar population synthesis models to fit the star-formation histories of anomalous sources and estimated their physical parameters using Markov Chain Monte Carlo.
 - Discovered significant correlations of physical parameters for anomalous sources using non-linear least squares minimization, Spearman correlation analysis, and linear regression.
3. **J. M. Helton**, A. L. Strom, J. E. Greene, et al., *The nebular properties of star-forming galaxies at intermediate redshift from the Large Early Galaxy Astrophysics Census*, ApJ, in review.
 - Observed and reduced new spectroscopic data for galaxies with extensive ancillary data.
 - Utilized data augmentation and manipulation to create samples of galaxies with consistent physical conditions to properly compare these samples without worry of observational biases.
 - Determined significant temporal trends of physical parameters for galaxies using non-linear least squares minimization and Spearman correlation analysis.
2. **J. M. Helton**, S. D. Johnson, J. E. Greene, et al., *Discovery and origins of giant optical nebulae surrounding quasar PKS0454–22*, 2021, MNRAS, 505, 4.
 - Developed a tool for removing the visual artifacts produced by bright point sources within integral field spectroscopic data using non-negative matrix factorization.
 - Identified and characterized galaxies and nebulae surrounding a quasar using integral field spectroscopy, non-linear least squares minimization, and detailed photoionization modeling.
 - Implemented a Gaussian mixture model to estimate the peculiar velocities of sources.
1. S. Aiola, E. Calabrese, et al., including **J. M. Helton**, *The Atacama Cosmology Telescope: DR4 Maps and Cosmological Parameters*, 2020, JCAP, 12, 047.
 - Estimated cosmological parameters using Markov Chain Monte Carlo and cosmological theory code for computing cosmic microwave background anisotropies and polarizations.

TECHNICAL SKILLS

Operating Systems

MacOS, Windows, Linux

Programming Languages

Python, Java, HTML, Javascript

Other Software and Tools

L^AT_EX, GitHub, MySQL, Pandas, TensorFlow, Microsoft Excel