

BENJAMIN J. GIBSON

University of Utah Department of Physics and Astronomy

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benjamin-gibson.github.io

Research Interests

Investigating ways to determine the kinematics, star formation history, and chemical evolution (collectively the chemodynamics) of the stellar populations in external galaxies using high resolution integrated light spectroscopy. I aim to apply these techniques to the Local Group in order to obtain a comprehensive understanding of its chemodynamics. This work will help bridge the divide between Milky Way and extragalactic astronomy, and better inform our models of galaxy formation and evolution.

Education

PhD in Physics, Astrophysics Track Sep. 2021 - Present
University of Utah, Salt Lake City, UT.
Advised by **Dr. Gail Zasowski** and **Dr. Anil Seth**

MS in Physics Jun. 2019 - Sep. 2021
University of Utah, Salt Lake City, UT.
Unweighted GPA: 3.868/4.000

BS in Physics, Minor in Mathematics Aug. 2015 - May 2019
Florida State University, Tallahassee, FL.
Overall Unweighted GPA: 3.603/4.000
Physics Unweighted GPA: 3.5/4.0

Research Experience

Mapping the Stellar Populations of M31 Jun. 2019 - Present
University of Utah
Advised by **Dr. Gail Zasowski** and **Dr. Anil Seth**

- Analyzed near-infrared integrated light spectra of the inner ~ 7 kpc of M31 from APOGEE.
- Reduced data to optimize for integrated light.
- Used full spectrum fitting with simple stellar population templates to obtain the radial velocity, velocity dispersion, age, metallicity, and α -element abundance of the stellar populations in the bulge and inner disk.

Critical Current of Superconducting Wires Aug. 2015 - Apr. 2016
Florida State University - *Undergraduate Research Opportunities Program*
Advised by **Dr. Sastry Pamidi**

- Measured the current at which a superconducting wire began to resist.
- Designed and built a cryostat to lower the sample to 65-77 K.
- Presented results at the FSU President's Undergraduate Research Symposium.

Teaching Experience

Graduate Teaching Assistant Aug. 2019 - Dec. 2020
University of Utah - *Department of Physics and Astronomy*

Fall 2020: Observational Astronomy, Physics II Lab for Scientists and Engineers

Spring 2020: General Physics II

Fall 2019: Observational Astronomy, The Solar System

Undergraduate Learning Assistant

Aug. 2018 - May 2019

Florida State University - *Department of Physics*

Fall 2018: Physics I Studio

Spring 2019: Physics I Studio

Publications

Gibson, Benjamin J., Zasowski, Gail,..., et al., *in prep*, *The Chemodynamics of the Stellar Populations in M31 from Integrated Light Spectroscopy*, to be submitted in Feb. 2023

Abdurro'uf,..., **Gibson, Benjamin J.**, et al., 2022, *The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data*, *Astrophys J Suppl Ser*, 259, 35 (arXiv:2112.02026)

First Author Presentations

Untangling the Chemodynamics of the Stellar Populations in M31

Nov. 2022

Linking the Galactic and Extragalactic - Contributed Talk
Wollongong, NSW, Australia

Chemodynamics from Integrated Light Spectroscopy

Aug. 2021

The SDSS Collaboration Meeting 2021 - Lightning Talk
Hosted by Johns Hopkins University, Baltimore, MD

An Infrared Mapping of the Interior of M31

Sep. 2020

Swigart Summer Research Symposium
University of Utah, Salt Lake City, UT

First Author Posters

Untangling the Chemodynamics of the Stellar Populations in M31

Jun. 2022

AAS 240 Summer Meeting
Pasadena, CA

An Infrared Mapping of the Interior of M31

Mar. 2021

Annual Physics & Astronomy Research Symposium
University of Utah, Salt Lake City, UT

Superconductors at Varying Temperatures

Mar. 2016

President's Undergraduate Research Symposium
Florida State University, Tallahassee, FL

Outreach Presentations

What does the Night Sky Really Look Like?

University of Utah Astronomy Summer Camp

Jul. 2022

Utah Astronomy Club

Sep. 2022

Our Saviours Lutheran Church Senior Luncheon

Sep. 2022

Astronomy on Tap Salt Lake City

Nov. 2022

Skyline High School Astronomy Club

Dec. 2022

Fellowships and Scholarships

Swigart First-Year Summer Graduate Research Fellowship

Apr. 2020

University of Utah - *Department of Physics and Astronomy*

Presidential Scholarship

Mar. 2015

Florida State University - *Honors College*

Awards and Honors

Outstanding Graduate Student Award

Apr. 2020

University of Utah - *Department of Physics and Astronomy*

Undergraduate Research Opportunities Program

Mar. 2015

Florida State University

Eagle Scout Rank

Jan. 2014

Boy Scouts of America Mecklenburg County Council

Service

Graduate Student Advisory Committee, Chair-Elect

Jun. 2022 - Present

Recruitment and Admissions Committee, Member

Aug. 2021 - Aug. 2022

Graduate Student Advisory Committee, Member

Jun. 2020 - Jun. 2022

Physics Graduate Social Committee, Chair

Jun. 2020 - Jun. 2022

Physics Graduate Peer Mentor Program, Mentor

Jun. 2020 - Jun. 2022

Physics Graduate Social Committee, Member

Aug. 2019 - Jun. 2020

University of Utah - *Department of Physics and Astronomy*

Professional Memberships

American Astronomical Society, Grad Student Member

Sep. 2021 - Present

Sloan Digital Sky Survey V

Apr. 2021 - Present

Sloan Digital Sky Survey IV

Jan. 2020 - Present

Skills

Programming Languages: Python, Matlab, LaTeX

Astronomy Software: astropy, pPXF, *The Cannon*, emcee

Analysis Methods: Full Spectrum Fitting, MCMC, Regression, Bootstrap Sampling, Classification, Jackknife Resampling

Other: Unix, Basic German