BENJAMIN J. GIBSON

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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.

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 June 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 June 2019 - Present
University of Utah
Advised by **Dr. Gail Zasowski** and **Dr. Anil Seth**

- Analyzed near-infrared integrated light spectra of the inner $\sim$6 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

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

First Author Presentations

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

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

Service

Recruitment and Admissions Committee, Member Aug. 2021 - Present
University of Utah - *Department of Physics and Astronomy*

Graduate Student Advisory Committee, Member Jun. 2020 - Present

University of Utah - *Department of Physics and Astronomy*

Physics Graduate Social Committee, Chair — Jun. 2020 - Present
University of Utah - *Department of Physics and Astronomy*

Physics Graduate Peer Mentor Program, Mentor — Jun. 2020 - Present
University of Utah - *Department of Physics and Astronomy*

Physics Graduate Social Committee, Member — Aug. 2019 - Jun. 2020
University of Utah - *Department of Physics and Astronomy*

Professional Memberships

American Astronomical Society, Graduate 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

Astronomy Software
emcee, astropy, pPXF, The Cannon

Analysis Methods
Full Spectrum Fitting, MCMC, Regression, Bootstrap Sampling, Classification

Other
Unix, Basic German