Tobin Wainer

(435)-260-0583
tobin.wainer@utah.edu
327 W. 200 S. Apt 204, Salt Lake City, Utah, 84101

Education

Honors Bachelor of Science in Physics with Astronomy Emphasis — May 2021
University of Utah, Salt Lake City, Utah

- Unweighted GPA: 3.90/4.0 (3.84/4.0 Physics GPA)
- Honors Thesis; "Star Clusters in the Triangulum Galaxy: Star Cluster Catalog and Mass Function Fitting"
- Undergraduate Research Scholar Designation

Honors and Awards

Honorable Mentions in the Chambliss Achievement Student Award competition for undergraduates at the 237th AAS conference — 2021

University of Utah Outstanding Undergraduate Research Award in Astronomy and Astrophysics — 2021

University of Utah representative for Research on Capitol Hill; presenting research to state legislators — 2021

Made Dean's List each eligible semester of enrollment — F17, S18, F19, F20

Research Experience for Undergraduates at Northwestern University — 2020

Summer Undergraduate Research Program at the University of Utah — 2019

One-year Peer Advisor Scholarship for dedication to student learning and excellence in teaching — $2000, 2019

Four-year Sterling Scholar Scholarship for Speech and Debate — $20,000, 2017-2020

Two-year Regents Scholarship — $6000, 2017-2019

Grants

NSF Graduate Research Fellowship Program — [Pending]

Undergraduate Research Opportunity Program Grant — $1200, 2020

Publications

Wainer, T., [9 Authors], "The Panchromatic Hubble Andromeda Treasury: Triangulum Extended Region (PHATTER). III. The Mass Function of Young Star Clusters in M33" *The Astrophysical Journal* [*submitted*].

Johnson, L.C., **Wainer, T.**, [6 Authors], "The Panchromatic Hubble Andromeda Treasury: Triangulum Extended Region (PHATTER). II. M33 Star Cluster Catalog" *The Astrophysical Journal* [*submitted*].

Research Experiences

Stellar variability in star cluster light curves May 2021 - Present
University of Utah
Mentored by **Dr. Gail Zasowski**

- Download and reduce TESS data to create reliable ensemble light curves of Milky Way star clusters
- Generate a pipeline to derive and analyze variability statistics from light curve data

Star cluster mass function for M33 June 2020 - October 2021
Northwestern University
Mentored by **Dr. Cliff Johnson**

- Participated in the Research Experience for Undergraduates at Northwestern University during summer 2020
  - Worked with HTML to construct a research website
  - Completed tutorials in Python, LaTex, Git and Github
  - Completed workshops in scientific writing and presenting science research
- Conducted simulation-based analysis to predict and model potential mass function biases caused by mass uncertainties
- Applied code to perform maximum-likelihood color magnitude diagram analysis to derive constraints on cluster properties.
- Wrote code to perform hierarchical Bayesian statistical analysis and Marcov Chain Monte Carlo probabilistic modeling
  - `https://github.com/tobin-wainer/mass_function_fitting`
- Performed literature reviews and performed analysis on previously published data using new modeling techniques

Star Cluster catalog for M33 January 2019 - September 2021
University of Utah
Mentored by **Dr. Anil Seth**

- Participated in the Summer Undergraduate Research Program during the Summer of 2019
- Wrote Python code to conduct statistical analysis of citizen science classification data that contributed to cluster catalog creation
- Created and implemented new methodology to analyze and model catalog completeness
- Created image products and web pages to review star cluster candidates

- Compiled research information to compare findings to previous results in the literature

---

Presentations and Conference Contributions

Undergraduate Research Symposium April 2021
University of Utah, Salt Lake City, Utah

237 Meeting of the AAS- Poster 150.07 (Link to Abstract) January 2021
Virtual

Research Experience for Undergraduate Symposium August 2020
Northwestern University and Adler Planetarium, Chicago, Illinois

235 Meeting of the AAS-Poster 306.02 (Link to Abstract) January 2020
Honolulu, Hawaii

2019 Physics Congress November 2019
Providence, Rhode Island

Summer Research Symposium August 2019
University of Utah, Salt Lake City, Utah

Teaching Experience

Teaching Assistant August 2018 - May 2021
University of Utah
Classes:

- *Astronomy 1010; The Universe*
  - Helped facilitate weekly 5-person teaching staff meeting to plan for the next week
  - Facilitated 20-person group sessions and provided one-on-one support
- *Physics 2210, 2020; Physics I for Scientists and Engineers, General Physics II*
  - Collaborated with teachers and program directors to meet academic needs of students
  - Graded student assignments and exams
- *LEAP 1010, 1020; Pre-Law I, Pre-Law II, Role of Law in Society*
  - Led class when professors were attending conferences

Service

Society of Physics Students Communications Director May 2019 - May 2021
University of Utah Chapter

- Raised over $7500 to send 12 undergraduates to the quadrennial SPS conference in Rhode Island
- Orchestrated monthly outreach events for local high school and middle school students
- Coordinated lab tours to help undergraduates discover research opportunities

Undergraduate Student Advisory Committee Associate Chair August 2019 - May 2021
University of Utah Department of Physics and Astronomy

- Worked with a six-person committee to generate a report providing a recommendation about a professor's Retention, Promotion, or Tenure
- Conducted interviews with professors, graduate students, and undergraduates to gather information
- Coordinate with the committee chair to facilitate meetings

Other Experience and Activities

Research on Capitol Hill February 2021
Salt Lake City Capital Building

- Selected as 1 of 15 undergraduates to represent the University of Utah
- Presented research to state legislators

Pro Bono Law Clinic Volunteer August 2019 - December 2019
Salt Lake City Pro Bono Law Clinic

- Worked alongside law students and practicing attorneys to provide clients with legal advice
- Conducted client interviews and consulted with attorneys
- Helped direct clients through necessary paperwork

Resident Advisor August 2018 - May 2019
University of Utah

- Assisted 30 residents with transitioning into a new living environment
- Facilitated floor meetings to discuss concerns, review complaints and convey policy changes
- Enforced policies and safety standards through building rounds
- Provided emotional support and counseling to residents coping with loss
- Provided swift and knowledgeable emergency support in line with campus crisis protocols

Hobbies

- Backpacking
- Mountaineering
- Skiing
- Sports fanatic

Skills

- Programming Languages: Python, HTML
- Astronomy Software: DS9, Astropy, MATCH, SLUG
- Data Analysis: integrated spectroscopy, using large survey data (HST), HST image processing
- Technical skills: Stellar population synthesis modeling
- Statistical Techniques: Bayesian Modelling, Regression, Bootstrap sampling
- Other software: LATEX, Github

Professional Memberships

American Astronomical Society (AAS)
American Physics Society (APS)
Society Of Physics Students (SPS)