# Tobin Wainer

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https://tobin-wainer.github.io

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| **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

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| **Honors and Awards** | Honorable Mentions in the Graduate Research Fellowship Program | 2022 |
| | 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 |

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| **Grants** | 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, 2022ApJ, 928, 15W* . |

Johnson, L.C., **Wainer, T.**, [11 Authors], "The Panchromatic Hubble Andromeda Treasury: Triangulum Extended Region (PHATTER). IV. M33 Star Cluster Catalog" *The Astrophysical Journal* [*submitted*].

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**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

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**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

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**Teaching Experience**

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

- *Astronomy 1010, 4090; The Universe, Stellar Astrophysics*
    - 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
    - Collaborate with professor to design class structure
- *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

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**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

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**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)