Tobin Wainer

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Education		
	Doctorate of Philosophy in Astronomy	Pending 2027
	University of Washington, Seattle, Washington	
	Masters of Science in Astronomy	Pending 2024
	University of Washington, Seattle, Washington	
	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 Graduate Research Fellowship Program	2024
	University of Utah Most Outstanding Teaching Assistant Award	2022
	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

Grants	Co-I: JWST Proposal. Cycle 3, ID. #5145	$Pending Budget Approval
	Co-I: Astrophysics Data Analysis Program (ADAP)	$262,000, 2024-2025 5.5 Months
	Undergraduate Research Opportunity Program Grant	$1200, 2020

Project Lead Publications

Wainer, T., [3 Authors], 2023, "ELK: A python package for correcting, analyzing, and diagnosing TESS integrated light curves", *The Journal of Open Source Software 2023 JOSS, 8(90), 05605*

Wainer, T., [9 Authors], 2023, "Catalog of Integrated-light Star Cluster Light Curves in TESS", *The Astronomical Journal, 2023AJ, 166, 106W*

Wainer, T., [12 Authors], 2022, "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], 2022, "The Panchromatic Hubble Andromeda Treasury: Triangulum Extended Region (PHATTER). IV. M33 Star Cluster Catalog", *The Astrophysical Journal 2022ApJ, 938, 81J*

Contribution Publications

Peltonen, J., [...] **Wainer, T.**, 2024, "JWST reveals star formation across a spiral arm in M33", *Monthly Notices of the Royal Astronomical Society, 527, I4*

Peltonen, J., [...] **Wainer, T.**, 2023, "Clusters, Clouds, and Correlations: Relating Young Clusters to Giant Molecular Clouds in M33 and M31", *Monthly Notices of the Royal Astronomical Society, 522, I4*

Gibson, B., [...] **Wainer, T.**, 2023, "The Chemodynamics of the Stellar Populations in M31 from APOGEE Integrated Light Spectroscopy" *The Astrophysical Journal 2023ApJ, 952, 23G*

Research Experiences

Searching for Stellar Cycles using Flares in TESS data   August 2023 - Present
University of Washington
Mentored by **Dr. James Davenport**

- Download and TESS light curves and characterize observed flares using `stella`
- Compute Flare energies and rates and statistically model the probability for a "quite" flare month.

High Mass Initial Mass Function for M33 Star Clusters   January 2023 - Present
University of Washington
Mentored by **Dr. Ben Williams**

- Compute the stellar mass function for M33 star clusters
- Use Bayesian statistics measure galactic wide initial mass function

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
- Developed open source pipeline "elk" to derive and analyze variability statistics from light curve data

    - `https://github.com/tobin-wainer/elk`

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

243rd Meeting of the AAS Contributing Talk   January 2024
   New Orleans, Louisiana

8th TESS Asteroseismic Science Consortium, Contributing Talk   July 2023
   Honolulu, Hawaii

240th Meeting of the AAS Poster 201.01 (Link to Abstract)   June 2022
   Pasadena, California

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   September 2022 - Current
University of Washington
Classes:

- *Astronomy 101a, 101b; Introduction to Astronomy In person and Online*
  - Lead 3 weekly sections of 30 students each
  - Make weekly recap lecture videos

Teaching Assistant   August 2018 - May 2022
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

Service

Senator in the University of Washington Graduate and Professional Student Senate   September 2023 - Present

- Serve the broader University student population on issues like affordability and student wellness.

Apache Point Observatory Telescope Allocation Committee   May 2023 - Present

- University of Washington graduate student representative for allocating telescope time of the 3.5 meter APO.
- Tasks include reading proposals and collaborating with faculty members of the TAC, to equitably allocate time.

University of Washington Astronomy Planetarium Technical Assistant
September 2023 - Present

- Point person for technological issues with the planetarium.
- Perform routine service to Planetarium software.

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)