

# Jason Trevor Hinkle

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## Research Interests

Observational astrophysics, with a broad interest in time domain astronomy and a particular focus on transient astronomy including tidal disruption events, active galactic nucleus flares, active galactic nucleus variability, and transient host galaxies.

## Education

**University of Hawai'i at Mānoa** — 2019 - present

Ph.D. in Astronomy (expected Spring 2025)

M.S. in Astronomy — Fall 2021

Advisor: Prof. Benjamin J. Shappee

**University of Maryland** — 2015 - 2019

B.S. in Physics with High Honors — May 2019

B.S. in Astronomy with High Honors — May 2019

Honors Thesis: *Ionization Mechanisms in Quasar Outflows*, Advisor: Prof. Sylvain Veilleux

## Honors and Awards

Ohio State University Center for Cosmology and Astroparticle Physics Price Prize — October 2023

University of Hawai'i Office of the Vice Provost for Research and Scholarship Student Award for Excellence in Research — May 2023

Columbia Communications ARCS Award in Astronomy — May 2022

Friends of the IfA Best 699-2 Award — Spring 2021

NSF Graduate Research Fellowship Program Honorable Mention — March 2021

Friends of the IfA Best 699-1 Award — Fall 2020

High Honors in Physics — Spring 2019

High Honors in Astronomy — Spring 2019

Honors College Research Grant — Fall 2018

University Honors Citation — November 2017

## Advising Experience

Allison Blum (UH REU); *Tidal Disruption Events* — March 2024 - present

Athena Engholm (UH undergraduate); *Ambiguous Nuclear Transients* — January 2024 - present

Ashley Tarrant (UH REU); *ASAS-SN AGN Variability* — April 2023 - present

Vera Berger (UH REU); *UV Stellar Flares with GALEX* — May 2022 - present

Willem Hoogendam (UH 1st year graduate student); *Tidal Disruption Events* — March 2023 - April 2024

Helena Treiber (UH REU); *AGNs in TESS* — March 2021 - August 2023

Michael Bolish (UH REU); *ASAS-SN AGN Variability* — May 2022 - July 2022

Jesse Zeldes (UH REU); *ASAS-SN M-dwarfs in K2 and TESS* — June 2020 - September 2021

## Professional Activities

Referee, Nature Astronomy — 2024 - present

Referee, Monthly Notices of the Royal Astronomical Society — 2023 - present

Member, High Energy Astrophysics Division of the AAS — 2023 - present

Referee, The Astrophysical Journal — 2021 - present

Member, American Astronomical Society — 2019 - present

## Presentations

- “Relating the Environments and Observables of TDEs”, Contributed Talk at *KITP Program: Towards a Physical Understanding of Tidal Disruption Events*
- “The Elusive Class of Ambiguous Nuclear Transients: Observational Trends, Physical Interpretations, and Open Questions”, Contributed Talk at *KITP Conference: Anticipating the Rising Tide of Tidal Disruption Events: Theory and Observations*
- “Building an ANT-Hill: The Growing Class of Ambiguous Nuclear Transients”, Contributed Talk at *Transients Down Under*
- “Messy Eaters: The Feeding Behaviors of Supermassive Black Holes”, Invited Price Prize Talk at *OSU CCAPP Seminars*
- “A TESS View of the Ambiguous Nuclear Transient ASASSN-18el”, Invited Talk at *June 2023 TESS Mission Update Meeting*
- “The Growing Class of Ambiguous Nuclear Transients”, Poster at *High Energy Astrophysics Division Meeting #20*, 117.08
- “The Growing Class of Ambiguous Nuclear Transients”, Poster at *eXtreme Black Holes Aspen Winter Conference*
- “Revealing AGNs Through TESS Variability”, Invited Talk at *TESS Science Team Meeting #29*
- “A TESS View of Ambiguous Nuclear Transients”, Contributed Talk at *TESS Science Conference II*
- “Discovery and Follow-up of the UV Luminous TDE ASASSN-19dj”, Poster at *Tidal Disruptions in Kyoto: Confronting Theory with Observations*
- “Fundamental X-ray Corona Parameters of Swift/BAT AGN”, Poster at *American Astronomical Society Meeting #235*, 304.29
- “Ionization Mechanisms in Quasar Outflows”, Poster at *American Astronomical Society Meeting #233*, 242.26

## Awarded Grants

Summary: 5 as Science PI (1 as FI for FINESST), 9 as Co-I.  $\sim$  \$275,000 awarded for PI grants.

**TESS Cycle 7** – “A TESS View Of The First Light From Tidal Disruption Events”; Science PI, 2024

**HST Cycle 34** – “Building an ANT-hill: STIS UV Follow-up of Ambiguous Nuclear Transients”; Science PI, awarded 2024

**HST Cycle 33** – “Building an ANT-hill: STIS UV Follow-up of Ambiguous Nuclear Transients”; Science PI, awarded 2024

**HST Cycle 32** – “Building an ANT-hill: STIS UV Follow-up of Ambiguous Nuclear Transients”; Science PI, 2024

**TESS Cycle 6** – “A TESS View Of The First Light From Tidal Disruption Events”; Science PI, 2023

**TESS Cycle 6** – “TESS Ground-Based Support Using ASAS-SN and SCAT”; Co-I, 2023

**FINESST** (Future Investigators in NASA Earth and Space Science and Technology) – “Tidal Disruption Events Under the Multiwavelength Microscope”; Future Investigator, 2023

**Swift Cycle 19** – “Early-Time UVOT and XRT Follow-up of bright TDEs”; Science PI, 2023

**Swift Cycle 19** – “Investigating the long-term trends of ASASSN-14ko’s periodic flares”; Co-I, 2023

**TESS Cycle 5** – “The Tess Transient Patrol”; Co-I, 2022

**TESS Cycle 5** – “Probing The Physics Of Tidal Disruption Events With Tess”; Co-I, 2022

**Swift Cycle 18** – “Bright Optical TDEs and Their Final Stages of Evolution”; Co-I, 2022

**Chandra Cycle 24** – “Observing the full X-ray evolution of an X-ray bright TDE”; Co-I, 2022

**NICER Cycle 3** – “Monitoring of a Newly Discovered X-ray Bright TDE Using NICER”; Co-I, 2021

**Chandra Cycle 23** – “Capturing the full X-ray evolution of an X-ray bright TDE ”; Co-I, 2021

**NICER Cycle 2** – “Monitoring of a Newly Discovered X-ray Bright Tidal Disruption Event Using NICER”; Co-I, 2020

## Ground-Based Telescope Time

Semester 2024B — Awarded: 32 h JCMT/SCUBA-2, 3 tracks SMA, 4 half-nights Keck-II/KCWI, 7.5 h ToO IRTF/Spex+Opihi, 9 half-nights IRTF/Spex

Semester 2024A — Awarded: 32 h JCMT/SCUBA-2, 3 tracks SMA, 3 half-nights Keck-II/KCWI, 7.5 h ToO IRTF/Spex+Opihi, 7 half-nights IRTF/Spex; Observed: 9 half-nights UH88/SNIFS

Semester 2023B — Awarded: 32 h JCMT/SCUBA-2, 3 tracks SMA, 6 half-nights Keck-II/KCWI, 7.5 h ToO IRTF/Spex+Opihi, 6 half-nights IRTF/Spex; Observed: 14 half-nights UH88/SNIFS

Semester 2023A — Awarded: 24 h JCMT/SCUBA-2, 2 tracks SMA, 30 h Gemini-N/GMOS, 30 h UKIRT/WFCAM, 6 h ToO IRTF/Spex, 5 half-nights IRTF/Spex; Observed: 12 half-nights UH88/SNIFS

Semester 2022B — Awarded: 24 h JCMT/SCUBA-2, 2 tracks SMA, 6 half-nights Keck-I/LRIS, 25 h UKIRT/WFCAM, 6 half-nights IRTF/Spex; Observed: 18 half-nights UH88/SNIFS

Semester 2022A — Awarded: 24 h JCMT/SCUBA-2, 3 tracks SMA, 5 half-nights Keck-I/LRIS, 26 h UKIRT/WFCAM, 4 half-nights IRTF/Spex; Observed: 17 half-nights UH88/SNIFS

Semester 2021B — Awarded: 6 half-nights IRTF/Spex (PI), 24 h JCMT/SCUBA-2, 3 tracks SMA, 28 h UKIRT/WFCAM, 8.9 h Gemini-N/GMOS (Co-I) ; Observed: 20 half-nights UH88/SNIFS

Semester 2021A — Awarded: 52 h JCMT/SCUBA-2, 5.5 tracks SMA, 35 h UKIRT/WFCAM, 14.9 h Gemini-N/GMOS (Co-I); Observed: 13 half-nights UH88/SNIFS

Semester 2020B — Awarded: 20 h UKIRT/WFCAM (PI); Observed: 15 half-nights UH88/SNIFS

Semester 2020A — Observed: 5 nights UH88/SNIFS

## Outreach

HiSTAR (Hawai’i Student/Teacher Astronomy Research) Mentor — Fall 2020 present

Astrobites Author — Spring 2020 - Present

Maunakea Scholars Program Mentor — Fall 2019 - present

Astrobites Hiring Committee Member — Fall 2020 - Spring 2023

Astrobites Undergraduate Co-Chair — Fall 2020 - Spring 2022

Astrobites Editorial Committee Member — Fall 2020 - Fall 2021  
 Astrobites Education Committee Member — Fall 2020 - Fall 2021  
 AAS Astronomy Ambassadors Program — January 2020  
 Volunteer at Institute for Astronomy Booth at AAS conference — January 2020  
 Mobile Planetarium Show at Mānoa Japanese Language School — December 2019  
 Research Talk to High School Students at Punahou School — November 2019  
 Volunteer at Institute for Astronomy Booth at SACNAS conference — November 2019  
 Honolulu Children and Youth Day — October 2019

## Service

Graduate Representative to the Scientific Staff Screening Committee — Fall 2023 - Spring 2023  
 Graduate Telescope Allocation Committee Representative — Semester 2024A  
 Graduate Research Oversight Group Representative — Fall 2022 - Spring 2023  
 Graduate Admissions Representative — Fall 2020 - Spring 2021  
 Graduate Colloquium Representative — Fall 2019 - Fall 2020  
 ASTR110L/110 Teaching Assistant — Fall 2019 - Spring 2020  
 ASTR100 Teaching Assistant — Fall 2018

## Publications

Summary: 38 total refereed/submitted publications, 12 first author, 23 with significant contribution (6 second author), and 3 with contribution. ~710 total citations (~250 first author), with an h-index of 15. The papers led by students I have co-advised are denoted by \*\*.

### *Submitted:*

1. **Hinkle, J. T.**, Shappee, B. J., Auchettl, K., et al. 2024, “Extreme Nuclear Transients Resulting from the Tidal Disruption of Intermediate Mass Stars”, *arXiv e-prints*, arXiv:2405.08855
2. **Hinkle, J. T.**, Shappee, B. J., & Tucker, M. A. 2023, “A Swift Fix II: Physical Parameters of Type I Superluminous Supernovae”, *arXiv e-prints*, arXiv:2309.03270
3. Tucker, M. A., **Hinkle, J. T.**, Angus, C. R. et al. 2024, “The Extremely Metal-Poor SN 2023ufx: A Local Analog to High-Redshift Type II Supernovae”, *arXiv e-prints*, arXiv:2405.00113
4. \*\*Zeldes, J., **Hinkle, J. T.**, Shappee, B. J., et al. 2021, “Flares Big and Small: a K2 and TESS View of ASAS-SN Superflares”, *arXiv e-prints*, arXiv:2109.04501

### *Accepted/Published:*

1. **Hinkle, J. T.** 2024, “Mid-Infrared Echoes of Ambiguous Nuclear Transients Reveal High Dust Covering Fractions: Evidence for Dusty Tori”, *Monthly Notices of the Royal Astronomical Society*, 531, 2603
2. **Hinkle, J. T.**, Shappee, B. J. & Holoien, T. W.-S. 2024, “Coronal Line Emitters are Tidal Disruption Events in Gas-Rich Environments”, *Monthly Notices of the Royal Astronomical Society*, 528, 4775
3. **Hinkle, J. T.**, Kochanek, C. S., Shappee, B. J., et al. 2023, “TESS Shines Light on the Origin of the Ambiguous Nuclear Transient ASASSN-18el”, *Monthly Notices of the Royal Astronomical Society*, 521, 3517
4. **Hinkle, J. T.**, Tucker, M. A., Shappee, B. J., et al. 2023, “SCAT uncovers ATLAS’s first

- tidal disruption event ATLAS18mlw: a faint and fast TDE in a quiescent Balmer strong Galaxy”, *Monthly Notices of the Royal Astronomical Society*, 519, 2035
5. **Hinkle, J. T.**, Holoien, T. W.-S., Shappee, B. J., et al. “The Curious Case of ASASSN-20hx: A Slowly Evolving, UV- and X-Ray-Luminous, Ambiguous Nuclear Transient”, *The Astrophysical Journal*, 930, 12
  6. **Hinkle, J. T.**, & Mushotzky, R. 2021, “Fundamental X-ray corona parameters of Swift/BAT AGN”, *Monthly Notices of the Royal Astronomical Society*, 506, 4960
  7. **Hinkle, J. T.**, Holoien, T. W.-S., Shappee, B. J., & Auchettl, K. 2021, “A Swift Fix for Nuclear Outbursts”, *The Astrophysical Journal*, 910, 83
  8. **Hinkle, J. T.**, Holoien, T. W.-S., Auchettl, K., et al. 2021, “Discovery and follow-up of ASASSN-19dj: an X-ray and UV luminous TDE in an extreme post-starburst galaxy”, *Monthly Notices of the Royal Astronomical Society*, 500, 1673
  9. **Hinkle, J. T.**, Holoien, T. W.-S., Shappee, B. J., et al. 2020, “Examining a Peak-luminosity/Decline-rate Relationship for Tidal Disruption Events”, *The Astrophysical Journal*, 894, L10
  10. **Hinkle, J. T.**, Veilleux, S., & Rupke, D. S. N. 2019, “Ionization Mechanisms in Quasar Outflows”, *The Astrophysical Journal*, 881, 31
  11. Dong, Y., Valenti, S., Ashall, C., et al. (incl. **Hinkle, J. T.**) 2023, “Characterizing the Rapid Hydrogen Disappearance in SN2022crv: Evidence of a Continuum between Type Ib and IIb Supernova Properties”, *The Astrophysical Journal*, in press
  12. **Berger, V. L., Hinkle, J. T.**, Tucker, M. A., et al. 2024, “Stellar Flares Are Far-Ultraviolet Luminous”, *Monthly Notices of the Royal Astronomical Society*, 532, 4436
  13. Pasham, D. R., Coughlin, E. R., Guolo, M., et al. (incl. **Hinkle, J. T.**) 2024, “A Potential Second Shutoff from AT2018fyk: An Updated Orbital Ephemeris of the Surviving Star under the Repeating Partial Tidal Disruption Event Paradigm”, *The Astrophysical Journal*, 971, L31
  14. **Hoogendam, W. B., Hinkle, J. T.**, Shappee, B. J., et al. 2024, “Discovery and Follow-up of ASASSN-23bd (AT 2023clx): The Lowest Redshift and Least Luminous Tidal Disruption Event To Date”, *Monthly Notices of the Royal Astronomical Society*, 530, 4501
  15. Gaidos, E., Thanathibodee, T., Hoffman, A., et al. (incl. **Hinkle, J. T.**) 2024, “The Dynamic, Chimeric Inner Disk of PDS 70”, *The Astrophysical Journal*, 966, 167
  16. Pasham, D. R., Tombesi, F., Sukova, P., et al. (incl. **Hinkle, J. T.**) 2024, “A Case for a Binary Black Hole System Revealed via Quasi-Periodic Outflows”, *Science Advances*, 10, 13
  17. Pearson, J., Sand, D. J., Lundqvist, P., et al. (incl. **Hinkle, J. T.**) 2024, “Strong Carbon Features and a Red Early Color in the Underluminous Type Ia SN 2022xkq”, *The Astrophysical Journal*, ApJ, 960, 29
  18. Ertini, K., Folatelli, G., Martinez, L., et al. (incl. **Hinkle, J. T.**) 2023, “SN 2021gno: a calcium-rich transient with double-peaked light curves”, *Monthly Notices of the Royal Astronomical Society*, 526, 279
  19. **Treiber, H. P., Hinkle, J. T.**, Fausnaugh, M. M., et al. 2023, “Revealing AGNs Through TESS Variability”, *Monthly Notices of the Royal Astronomical Society*, 525, 5795
  20. Desai, D. D., Ashall, C., Shappee, B. J., et al. (incl. **Hinkle, J. T.**) 2023, “Fast and not-so-furious: Case study of the fast and faint type IIb SN 2021bxu”, *Monthly Notices of the Royal*

21. Payne, A. V., Auchettl, K., Shappee, B. J., et al. (incl. **Hinkle, J. T.**) 2023, “Chandra, HST/STIS, NICER, Swift, and TESS Detail the Flare Evolution of the Repeating Nuclear Transient ASASSN -14ko”, *The Astrophysical Journal*, 951, 134
22. Holoien, T. W.-S., Berger, V. L., **Hinkle, J. T.**, et al. 2023, “Examining the Properties of Low-luminosity Hosts of Type Ia Supernovae from ASASSN”, *The Astrophysical Journal*, 950, 108
23. Neustadt, J. M. M., **Hinkle, J. T.**, Kochanek, C. S., et al. 2023, “Multiple flares in the changing-look AGN NGC 5273”, *Monthly Notices of the Royal Astronomical Society*, 521, 3810
24. de Jaeger, T., Shappee, B. J., Kochanek, C. S., et al. (incl. **Hinkle, J. T.**) 2023, “Optical/ $\gamma$ -ray blazar flare correlations: understanding the high-energy emission process using ASASSN and Fermi light curves”, *Monthly Notices of the Royal Astronomical Society*, 519, 6349
25. Tucker, M. A., Shappee, B. J., Huber, M. E., et al. (incl. **Hinkle, J. T.**) 2022, “The Spectroscopic Classification of Astronomical Transients (SCAT) Survey: Overview, Pipeline Description, Initial Results, and Future Plans”, *Publications of the Astronomical Society of the Pacific*, 134, 124502
26. Jayasinghe, T., Thompson, T. A., Kochanek, C. S., et al. (incl. **Hinkle, J. T.**) 2022, “The ‘Giraffe’: discovery of a stripped red giant in an interacting binary with an  $2 M_{\odot}$  lower giant”, *Monthly Notices of the Royal Astronomical Society*, 516, 5945
27. Liu, M. C., Magnier, E. A., Zhang, Z., et al. (incl. **Hinkle, J. T.**) 2022, “On the Unusual Variability of 2MASS J06195260-2903592: A Long-lived Disk around a Young Ultracool Dwarf”, *The Astronomical Journal*, 164, 165
28. Holoien, T. W.-S., Neustadt, J. M. M., Valley, P. J., et al. (incl. **Hinkle, J. T.**) 2022, “Investigating the Nature of the Luminous Ambiguous Nuclear Transient ASASSN-17jz”, *The Astrophysical Journal*, 933, 196
29. Payne, A. V., Shappee, B. J., **Hinkle, J. T.**, et al. 2022, “The Rapid X-Ray and UV Evolution of ASASSN-14ko”, *The Astrophysical Journal*, 926, 142
30. Tucker, M. A., Shappee, B. J., **Hinkle, J. T.**, et al. 2021, “An AMUSING look at the host of the periodic nuclear transient ASASSN-14ko reveals a second AGN”, *Monthly Notices of the Royal Astronomical Society*, 506, 6014
31. Jayasinghe, T., Kochanek, C. S., Strader, J., et al. (incl. **Hinkle, J. T.**) 2021, “The loudest stellar heartbeat: characterizing the most extreme amplitude heartbeat star system”, *Monthly Notices of the Royal Astronomical Society*, 506, 4083
32. Jayasinghe, T., Stanek, K. Z., Thompson, T. A., et al. (incl. **Hinkle, J. T.**) 2021, “A unicorn in monoceros: the  $3 M_{\odot}$  dark companion to the bright, nearby red giant V723 Mon is a non-interacting, mass-gap black hole candidate”, *Monthly Notices of the Royal Astronomical Society*, 504, 2577
33. Payne, A. V., Shappee, B. J., **Hinkle, J. T.**, et al. 2021, “ASASSN-14ko is a Periodic Nuclear Transient in ESO 253-G003”, *The Astrophysical Journal*, 910, 125
34. Holoien, T. W.-S., Auchettl, K., Tucker, M. A., et al. (incl. **Hinkle, J. T.**) 2020, “The Rise and Fall of ASASSN-18pg: Following a TDE from Early to Late Times”, *The Astrophysical Journal*, 898, 161