David J. Wilson

Website: davidjwilson.github.io
Email: djwilson394@gmail.com
GitHub: github.com/davidjwilson

Education

University of Warwick — Coventry, UK
Ph.D. in Physics, Advisor: Boris Gänsicke — 2013–2017
- Thesis: "Observations of Remnant Planetary Systems at White Dwarfs"

Lancaster University/Michigan State University — Lancaster, UK/East Lansing, USA
MPhys (Hons) in Physics/Year Abroad — 2009–2013
- Thesis: "The Ever-Changing Sun: Multi-wavelength Solar Observations"

Professional Appointments

Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder — Boulder, USA
Research Associate — 2022–present

McDonald Observatory, University of Texas at Austin — Austin, USA
Postdoctoral Research Fellow — 2018–2022

Department of Physics, University of Warwick — Coventry, UK
Postdoctoral Research Fellow — 2017–2018

Grants and Awards

- April 2025: $ 58k HST Cycle 32 PID HST-GO-17778
- January 2024: $ 70k TESS Cycle 6 Program 6151
- July 2023: $ 454k Astrophysics Decadal Survey Precursor Science grant 22-ADSPS22-0020
- May 2023: $ 8.5m MANTIS CubeSat APRA (as Science PI) 22-APRA22-0121
- March 2023: $ 60k HST PID HST-GO-17282.
- February 2021: $ 42k HST PID HST-GO-16449.
- December 2018: $ 65k Chandra Program 20200610.

Selected Telescope Time Awarded as PI

- *HST*/WFC3/ACS (Cycle 30), Program ID 17282, 15 orbits: "Ultraviolet Photometry of TRAPPIST-1 during the next JWST Observing Window"
- *HST*/STIS (Cycle 28), Program ID 16449, 4 orbits: "Testing the Lyman Alpha reconstructions vital for stellar and exoplanet astronomy."
- Multiple *Swift* TOO awards totalling > 60 ksec.

- *Chandra* (Cycle 20), Program ID 20200610, 110 ksec: "Characterising the soft X-ray activity of the metal-rich white dwarf GD 394."
- *HST*/COS/STIS+*XMM Newton* (Cycle 25), Program ID 15189, 12 *HST* orbits + 43 ksec *XMM* time: "Post Common Envelope Binaries as probes of M dwarf stellar wind and habitable zone radiation environments."
- VLT/X-shooter (Period 99), Run ID 099.C-0811(A), 2 hours: "Confirmation of gaseous emission from a planetary debris disc at a white dwarf."
- *HST*/STIS (Cycle 22), Program ID 13719, eight orbits: "Accretion of planetary debris onto the unique white dwarf GD394."

Selected Conference Talks

- February 2025: " Ultraviolet and X-ray Characterisation of JWST and HWO Planet Host Stars", Know Thy Star 2 Conference, Pasadena, CA.
- April 2024: "Ultraviolet and X-ray Characterisation of Exoplanet Host Stars", SEEC Symposium, NASA GSFC.
- June 2023: "UV and X-ray characterisation of exoplanet host stars", Exoclimes VI, Exeter, UK.
- July 2022: "Measurements of The Ultraviolet Spectral Characteristics of Low-Mass Exoplanetary Systems (Mega-MUSCLES)", Science with the Hubble and James Webb Space Telescopes VI, Stockholm, Sweden.
- July 2022: "White dwarfs as tracers of M dwarf stellar winds", Cool Stars 21, Toulouse, France
- October 2019: "Discovery of an Irradiated Brown Dwarf Companion to a White Dwarf", IAU Symposium 357, Hilo, Hawaii.
- July 2018: "White dwarfs as tracers of M dwarf stellar winds", EuroWD21, Austin, Texas.
- December 2017: "Measuring planetary chemistry via observations of remnant planetary systems at white dwarfs", 51st ESLAB Symposium, ESTEC.

Teaching

- Ongoing: Advisor for undergraduate student reseachers at CU Boulder.
- Fall Semester 2022: Instructor for ASTR1200-02 Stars & Galaxies course at CU Boulder.
- Summer 2019, 2021: Research Mentor for TAURUS (Texas Astronomy Undergraduate Research experience for Under-represented Students).
- 2013–2016: Electronics Labs Demonstrator, University of Warwick.

Professional Service

- 2023 Onwards: High Energy task group co-lead for the Target Stars and Systems HWO sub-working group.
- Ongoing: Regular external reviewer for *Hubble Space Telescope* proposals.

- Ongoing: Regular peer reviewer for AAS Journals.
- 2021-2022: Panelist for the *TESS* Cycle 4 and 5 reviews.
- October 2020: Panelist for the ADAP 2020 review.
- 2020-2021: ExoPAG SAG 22 working group member.
- December 2018: Panelist for the *Swift* Cycle 15 review.

Selected Outreach Activities

- 2024: NPR interview "Scientists predict a new star will appear soon".
- 2018–2020: Regular speaker at Astronomy on Tap ATX.
- 2014-2016: Writer for the Astrobites Collaboration.
- 2013–2018: Presenter for Warwick Astronomy Group planetarium visits to local schools.

Refereed Publications

First Author

1. Wilson et al. (2025), *ApJ*, 978, 85, "The Mega-MUSCLES Treasury Survey: X-Ray to Infrared Spectral Energy Distributions of a Representative Sample of M Dwarfs"
2. Wilson et al. (2022), *ApJ*, 936, 189, "Testing Ly Emission-line Reconstruction Routines at Multiple Velocities in One System"
3. Wilson et al. (2021), *MNRAS*, 508, 561, "Discovery of a young pre-intermediate polar"
4. Wilson et al. (2021), *ApJ*, 911, 18, "The Mega-MUSCLES Spectral Energy Distribution of TRAPPIST-1"
5. Wilson et al. (2020), *ApJL*, 897, L31, "Optical Detection of the 1.1 day Variability at the White Dwarf GD 394 with TESS"
6. Wilson et al. (2019), *MNRAS*, 483, 2941, "Multiwavelength observations of the EUV variable metal-rich white dwarf GD 394"
7. Wilson et al. (2016), *MNRAS*, 459, 3282, "Carbon to oxygen ratios in extrasolar planetesimals"
8. Wilson et al. (2015), *MNRAS*, 451, 3237, "The composition of a disrupted extrasolar planetesimal at SDSS J0845+2257 (Ton 345)"
9. Wilson et al. (2014), *MNRAS*, 445, 1878, "Variable emission from a gaseous disc around a metal-polluted white dwarf"

Contributing Author

1. Duvvuri et al. (2025), *ApJ*, 993, 138, "Stellar Library of Differential Emission Measures and Extreme Ultraviolet Spectra: Dwarf Stars Observed by the Extreme Ultraviolet Explorer"
2. Peacock et al. (2025), *AJ*, 170, 293, "HWO Target Stars and Systems: A Survey of Archival UV and X-Ray Data"
3. Froning et al. (2025), *arXiv*, arXiv:2510.27639, "X-ray and UV Observations of the Young Sun HIP 67522: Evidence of Lyman-alpha Absorption Within the Planetary System"

4. Kahle et al. (2025), *AA*, 701, A184, "The SPACE Program: I. The featureless spectrum of HD 86226 c challenges sub-Neptune atmosphere trends"
5. France et al. (2025), *AJ*, 170, 159, "A Semiempirical Estimate of Solar Extreme-ultraviolet Evolution from 10 Myr to 10 Gyr"
6. Williams et al. (2025), *MNRAS*, 541, 1377, "Measurements of three exo-planetesimal compositions: a planetary core, a chondritic body, and an icy Kuiper belt analogue"
7. Zhang et al. (2025), *AJ*, 169, 204, "Constraining Atmospheric Composition from the Outflow: Helium Observations Reveal the Fundamental Properties of Two Planets Straddling the Radius Gap"
8. Loyd et al. (2025), *Natur*, 638, 636, "Hydrogen escaping from a pair of exoplanets smaller than Neptune"
9. Czesla et al. (2024), *AA*, 692, A230, "The overflowing atmosphere of WASP-121 b: High-resolution He I 10833 transmission spectroscopy with VLT/CRIRES⁺"
10. Thao et al. (2024), *AJ*, 168, 297, "The Featherweight Giant: Unraveling the Atmosphere of a 17 Myr Planet with JWST"
11. Diamond-Lowe et al. (2024), *A&A* , "High-energy spectra of LTT 1445A and GJ 486 reveal flares and activity"
12. Sahu et al. (2024) *MNRAS*, 526, 580, "An HST COS ultraviolet spectroscopic survey of 311 DA white dwarfs - I. Fundamental parameters and comparative studies "
13. Behr et al (2023), *AJ*, 166, 35, "The MUSCLES Extension for Atmospheric Transmission Spectroscopy: UV and X-Ray Host-star Observations for JWST ERS GTO Targets"
14. Brown et al. (2023), *AJ*, 165, 195, "Coronal X-Ray Emission from Nearby, Low-mass, Exoplanet Host Stars Observed by the MUSCLES and Mega-MUSCLES HST Treasury Survey Projects."
15. Brown et al. (2022), *AJ*, 164, 206: "X-Ray Emission from the Exoplanet Hosting LTT 1445 Triple Star System."
16. Manser et al. (2021), *MNRAS*, 508, 5657:"Velocity-imaging the rapidly precessing planetary disc around the white dwarf HE 1349-2305 using Doppler tomography."
17. Lin et al. (2021), *MNRAS*, 505, 3562: "Differentiating modern and prebiotic Earth scenarios for TRAPPIST-1e: high-resolution transmission spectra and predictions for JWST."
18. Gentile Fusillo et al. (2021), *MRNAS*, 504, 2707: "White dwarfs with planetary remnants in the era of Gaia - I. Six emission line systems."
19. Hermes et al. (2021), *ApJL*, 914, L3: "8.9 hr Rotation in the Partly Burnt Runaway Stellar Remnant LP 40-365 (GD 492)."
20. Duvvuri et al. (2021), *ApJ*, 913, 40:"Reconstructing the Extreme Ultraviolet Emission of Cool Dwarfs Using Differential Emission Measure Polynomials."
21. France et al. (2020), *AJ*, "The High-Energy Radiation Environment Around a 10 Gyr M Dwarf: Habitable at Last?"
22. Linsky et al. (2020), *ApJ*, 902, 3, "The Relative Emission from Chromospheres and Coronae: Dependence on Spectral Type and Age"
23. Melbourne et al. (2020), *ApJ*, "Estimating the Ultraviolet Emission of M dwarfs with Exoplanets from Ca II and Hα"

24. Gaidos et al. (2020), *MNRASL*, 148, "Zodiacal Exoplanets in Time. XI. The Orbit and Radiation Environment of the Young M Dwarf-Hosted Planet K2-25b"

25. Wunderlich et al. (2020), *APJ*, "Distinguishing between wet and dry atmospheres of TRAPPIST-1 e and f"

26. Ashley et al. (2019), *MNRAS*, 484, 5362: "Evidence for bimodal orbital separations of white dwarf-red dwarf binary stars."

27. Manser et al.(2019) *Science*, 364, 66: "A planetesimal orbiting within the debris disc around a white dwarf star."

28. Froning et al.(2019) *ApJl*, 871, L26: "A Hot Ultraviolet Flare on the M Dwarf Star GJ 674."

29. Xu et al.(2018) *ApJ*, 866, 108: "Infrared Variability of Two Dusty White Dwarfs."

30. Davenport et al. (2017), *ApJ*, 853, 130: "The GALEX view of "Boyajian's Star" (KIC 8462852)."