

Tim Cunningham

NASA Hubble Fellow

Harvard University

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NASA Hubble Fellow at Harvard & Smithsonian Center for Astrophysics (Assistant Professor at University of Warwick starting Sept 2026), utilizing multi-dimensional radiation-hydrodynamic simulations and multi-wavelength observational strategies to study convection in degenerate stars and white dwarf populations. Experienced observer with spectroscopic and photometric expertise. Commitment to leadership roles, mentoring, outreach and teaching.

Academic Qualifications

University of Warwick Coventry, UK	Ph.D. in Physics September 2020
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Group: *Astronomy and Astrophysics*
Thesis: Convective overshoot in the atmosphere of white dwarf stars
Supervisor: Pier-Emmanuel Tremblay

King's College London London, UK	MSci in Physics September 2014
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Reading: Physics
Class: First Class Honors

Professional Appointments

University of Warwick Coventry, UK - STFC Ernest Rutherford Fellow	Assistant Professor Sept 2026–
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Harvard University Cambridge, MA, US	NASA Hubble Fellow Sept 2023–Aug 2026
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University of Warwick Coventry, UK	Postdoctoral Research Fellow July 2020 – Sept 2023
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University of California, Santa Barbara Santa Barbara, CA, US	Research Assistant Apr – Sept 2013
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Publications (with links)

Metrics: h-index=21 on 45+ abstracts with 2,000+ citations ([Google Scholar](#); [ORCID](#))

As Lead Author.....

- | | |
|--|------|
| 10. Cunningham, T. , Caiazzo, I, Raymond, J., et al. 2026, ApJ , accepted | 2026 |
| <i>Detection of knots in the supernova type Ia remnant Pa 30</i> | |
| 9. Cunningham, T. , Caiazzo, I, Sienkiewicz, G., et al. 2025b, MNRAS , 540, 633 | 2025 |
| <i>Serendipitous discovery of two new polars evolved past the period bounce</i> | |
| 8. Cunningham, T. , Tremblay, P.-E., O'Brien, M., et al. 2025a, MNRAS , 539, 2021. | 2025 |
| <i>The dearth of high-mass hydrogen-atmosphere metal-polluted white dwarfs within 40 pc</i> | |
| 7. Cunningham, T. , Caiazzo, I., Prusinski, N., et al. 2024b, ApJL , 975, L7 | 2024 |
| <i>Expansion properties of the young supernova type Ia remnant Pa 30 revealed</i> | |
| 6. Cunningham, T. , Tremblay, P.-E., O'Brien, M. 2024a, MNRAS , 527, 3602 | 2024 |

Initial-final mass relation from white dwarfs within 40 pc

5. **Cunningham, T.**, Wheatley, P. J., Tremblay, P.-E., et al. 2022, **Nature**, 602, 219 2022
A White Dwarf Accreting Planetary Material Determined from X-ray Observations
4. **Cunningham, T.**, Tremblay, P.-E., Bauer, E., et al. 2021, **MNRAS**, 503, 1646 2021
Horizontal Spreading of Planetary Debris Accreted by White Dwarfs
3. **Cunningham, T.**, Tremblay, P.-E., Gentile Fusillo, N. P., et al. 2020, **MNRAS**, 492, 3540 2020
From Hydrogen to Helium: The Spectral Evolution of White Dwarfs as Evidence for Convective Mixing
2. **Cunningham, T.**, Tremblay, P.-E., Freytag, B., et al. 2019, **MNRAS**, 488, 2503 2019
Convective Overshoot and Macroscopic Diffusion in Pure-Hydrogen-Atmosphere White Dwarfs
1. **Cunningham T.**, Wolf W. M. & Bildsten L. 2015, **ApJ**, 803, 76 2015
Photoionization Heating of Nova Ejecta by the Post-Outburst Supersoft Source

As Co-Author.....

38. Ould Rouis, L. B., et al. 2026, **ApJ**, in prep. 2026
Using White Dwarf Gaia Spectra to Increase the Sample of Massive Remnant Planetary System Hosts
37. van Roestel, J., et al. 2026, **A&A**, submitted. 2026
Now you see me, and now you don't...Obscuration of white dwarfs by dust and debris as the result of planetesimal disruption events
36. O'Brien, M., et al. 2026, **MNRAS**, accepted. 2026
White dwarfs within 13 pc: Insights from ultraviolet spectroscopy
35. Chen, W., et al. 2026, **MNRAS**, accepted. 2026
3D Model Spectra of White Dwarfs Accreting Planetary Debris
34. Riva, F., et al. 2026, **A&A Letters**, accepted. 2026
Kilogauss magnetic fields from simulations of small-scale dynamo action in the convective envelope of a white dwarf
33. Williams, J. T., et al. 2026, **Nature Astron.**, accepted 2026
A white dwarf accreting a candidate second-generation planet
32. Yang, H., et al. 2026, **ApJ**, accepted. 2026
A Minute-Cadence Deep Bulge Survey: First Data Release of DREAMS
31. Rogers, L., et al. 2026, **ApJ**, accepted. 2026
Spectroscopic Monitoring of Metal Lines in Polluted White Dwarfs
30. Pham, D., et al. 2026, **ApJ**, accepted. 2026
The Effects of Magnetic Accretion on the Spatial Extent of White Dwarf Pollution
29. Cherubim, C., et al. 2026, **Science**, in press. 2026
Escaping helium atmosphere on a terrestrial planet in a nearby habitable zone
28. Desai, A., et al. 2026, **A&A**, accepted. 2026
Circumstellar interaction in the extreme white dwarf merger remnant ZTF J1901+1458: A new class of white dwarf merger remnants with X-ray emission
27. Elms, A., et al. 2026, **MNRAS**, 581, 1 2026
Detection of a weak magnetic field in the Balmer emission line white dwarf WDJ1653-1001

26. Pallathadka, A., et al. 2026, **ApJ**, 999, 251 2025
Double White Dwarf Binaries in SDSS-V DR19: The discovery of a rare DA+DQ white dwarf binary with 31 hour orbital period
25. Bauer, E., et al. 2026, **ApJSS**, 283, 41 2025
MESA Isochrones and Stellar Tracks (MIST) III. The White Dwarf Cooling Sequence
24. Cristea, A., et al. 2026, **A&A**, 706, 188 2026
A half-ring of ionized circumstellar material trapped in the magnetosphere of a white dwarf merger remnant. A new class of white dwarf merger remnants with X-ray emission
23. Buchan, A., et al. 2025, **MNRAS**, 544, 2098 2025
Exogeological inferences from white dwarf pollutants: the impact of stellar physics
22. Kollmeier, J., et al. 2025, **AJ**, 171, 1 2025
Sloan Digital Sky Survey-V: Pioneering Panoptic Spectroscopy
21. Munday, J., et al. 2025, **MNRAS**, 541, 3494 2025
The DBL Survey II: towards a mass-period distribution of double white dwarf binaries
20. Roberts, E., et al. 2025, **MNRAS**, 538, 2548 2025
Comparison of methods used to derive the Galactic star formation history from white dwarf samples
19. Munday, J., et al. 2025, **Nature Astron.**, 9, 872 2025
There is a super-Chandrasekhar mass type Ia supernova progenitor located 49 pc away that will detonate in 23 Gyr
18. Sahu, S., et al. 2025, **Nature Astron.**, 9, 1347 2025
Ultraviolet carbon detection reveals a hot white dwarf merger remnant
17. Williams, J. T., et al. 2024, **A&A**, 691, A352 2024
PEWDD: A database of white dwarfs enriched by exo-planetary material
16. Elms, A. et al. 2024, **MNRAS**, 534, 2758 2024
A network of cooler white dwarfs as infrared standards for flux calibration
15. Munday, J. et al. 2024, **MNRAS**, 532, 2534 2024
The DBL Survey I: discovery of 34 double-lined double white dwarf binaries
14. O'Brien, M. W., et al. 2023, **MNRAS**, 527, 8687 2024
The 40 parsec sample of white dwarfs from Gaia
13. Corrales, L., et al. 2023, (AXIS white paper) 2023
The life cycle of stars and their planets from the high energy perspective
12. Rebassa-Mansergas, A., et al. 2023, **MNRAS**, 526, 4787 2023
Main-sequence companions to white dwarfs – II. The age–activity–rotation relation from a sample of Gaia common proper motion pairs
11. O'Brien, M. W., et al. 2023, **MNRAS**, 518, 3055 2023
Gaia white dwarfs within 40 pc III: spectroscopic observations of new candidates in the southern hemisphere
10. Elms, A. K., et al. 2022, **MNRAS**, 517, 4557 2022
Spectral analysis of ultra-cool white dwarfs polluted by planetary debris
9. Raddi, R., et al. 2022, **A&A**, 658, A22 2022

Kinematic properties of white dwarfs. Galactic orbital parameters and age-velocity dispersion relation

8. Rebassa-Mansergas, A., et al. 2021, **MNRAS**, 505, 3165 2021
Constraining the solar neighbourhood age-metallicity relation from white dwarf-main sequence binaries
7. Veras, D., et al. 2021, **MNRAS**, 506, 1148 2021
The entry geometry and velocity of planetary debris into the Roche sphere of a white dwarf
6. McCleery, J., et al. 2020, **MNRAS**, 499, 1890 2020
Gaia white dwarfs within 40 pc II: the volume-limited Northern hemisphere sample
5. Tremblay, P.-E., et al. 2020, **MNRAS**, 497, 130 2020
Gaia White Dwarfs within 40 pc I: Spectroscopic Observations of New Candidates
4. Green, M. J., et al. 2020, **MNRAS**, 496, 1243 2020
Spectroscopic and Photometric Periods of Six Ultracompact Accreting Binaries
3. Tremblay, P.-E., et al. 2019, **MNRAS**, 482, 5222 2019
Fundamental Parameter Accuracy of DA and DB White Dwarfs in Gaia Data Release 2
2. Gentile Fusillo, N. P., et al. 2019, **MNRAS**, 482, 4570 2019
A Gaia Data Release 2 catalogue of white dwarfs and a comparison with SDSS
1. Tremblay, P.-E., et al. 2019, **Nature**, 565, 202 2019
Core Crystallization and Pile-up in the Cooling Sequence of Evolving White Dwarfs

Telescope Time Awarded as PI

Metrics: 1.1 Ms (315 hours) of *Chandra*/*XMM-Newton* time, 44 hours of *JWST* time, 22 orbits of *HST* time, and 29 nights of >6.5m ground-based spectroscopy and photometry awarded as PI:

Space-based.....	
<i>XMM-Newton</i> : AO 25 (#098376) – 15 hours (54 ks, priority A) <i>“X-ray emission from white dwarfs accreting planetary debris”</i>	2025
<i>XMM-Newton</i> : AO 25 (#098376) – 36 hours (128 ks, priority C) <i>“Metal-polluted white dwarfs as novel X-ray sources”</i>	2025
<i>Chandra</i> + <i>JWST</i> : Cycle 27 (#27300224) – 14 hours (50 ks) with ACIS-S + 5.5 hours <i>JWST</i> NIRSec/MIRI <i>“Accretion-induced X-ray emission from the closest candidate polar”</i> PI: Cunningham	2025
<i>HST</i> : Cycle 33 (GO #18082) – 16 orbits <i>“A Deeper Look at the Type Ia Supernova Remnant Pa 30”</i> PI: Cunningham	2025
<i>HST</i> : Cycle 33–35 (GO #18078) – 6 orbits <i>“Constraining variability of white dwarf planetary debris accretion”</i> PI: Cunningham	2025
<i>JWST</i> : Cycle 4 (GO #9077) – 11.8 hours <i>“The iconic debris disk surrounding the white dwarf G29-38”</i> PI: Cunningham	2025
<i>JWST</i> : Cycle 4 (GO #9111) – 26.7 hours	2025

"An Infrared View of the Type Iax Supernova Remnant Pa 30"

Co-PI: Cunningham | PI: Caiazzo

XMM-Newton: AO 24 (#096498) – 36 hours (128 ks, priority C)	2024
<i>"Metal-polluted white dwarfs as novel X-ray sources"</i>	
XMM-Newton: AO 23 (#09418801) – 34 hours (124 ks, priority C)	2023
<i>"Metal-polluted white dwarfs as novel X-ray sources"</i>	
Chandra: Cycle 25 (#25200153) – 104 hours (375 ks) with HRC-I	2023
<i>"Constraining the time-dependent accretion rate of a novel class of X-ray source"</i>	
Chandra: Cycle 25 (#25200459) – 10 hours (35 ks) with ACIS-S	2023
<i>"Earliest X-rays from a possible late thermal pulse?"</i>	
Chandra: Cycle 24 (#24200446) – 35 hours (125 ks) with HRC-I	2022
<i>"Constraining the time-dependent accretion rate of a novel class of X-ray source"</i>	
Chandra: Cycle 22 (#22200039) – 32 hours (115 ks) with ACIS-S	2020
<i>"First X-rays from white dwarf planet accretion: a definitive test of convective overshoot"</i>	

Ground-based.....

GTC: 2026B – 19.5 hours high-cadence optical multi-band photometry with HiPERCAM	2026
<i>"From the NUV to the MIR: A Panchromatic View of G29-38"</i>	
IRTF: 2026B – 33 hours optical and near-infrared spectroscopy with SpeX	2026
<i>"Debris disk response to the stellar pulsations of G29-38"</i>	
Gemini: 2026A – 6.4 hours optical spectroscopy with GMOS-S	2026
<i>"Phase resolved spectroscopy for Ultramassive WDs"</i>	
Gemini: 2026A – 5.0 hours optical spectroscopy with GMOS-N	2025
<i>"Phase resolved spectroscopy for Ultramassive WDs"</i>	
Gemini: Fast Turnaround May 2025 – 6.9 hours imaging with GMOS-N	2025
<i>"A Deeper Look at the Type Iax Supernova Remnant Pa 30"</i>	
FLWO: Semester 2025B – 16 nights with FLWO/KeplerCam	2025
<i>"JWST synergistic optical monitoring of the iconic debris disk surrounding the white dwarf G29-38"</i>	
MMT: 2025B – 3 nights spectroscopy with Binospec	2025
<i>"Double-lined double white dwarf binaries as progenitors for Type Ia supernovae"</i>	
MMT: 2025B – 1 night imaging with MMTCam	2025
<i>"A Deeper Look at the Type Iax Supernova Remnant Pa 30"</i>	
MMT: 2025B – 2 nights imaging with MMIRS	2025
<i>"Novel accreting white dwarfs identified through X-ray emission and photometric variability"</i>	
Magellan: Semester 2025A – 4.5 nights with FourStar/MagE	2025
<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	
Magellan: Semester 2025A – 3 nights with FourStar/MagE	2025
<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	
MMT: Semester 2025A – 3 nights with Binospec	2025

<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	
MMT: Semester 2024B – 1 nights with Binospec	2024
<i>"White dwarf gaseous disks discovered in SDSS-V"</i>	
MMT: Semester 2024B – 1 nights with Binospec	2024
<i>"Extreme white dwarfs in the Solar neighbourhood"</i>	
MMT: Semester 2024B – 1 nights with MMIRS	2024
<i>"Confirming the first strongly asynchronous polar"</i>	
MMT: Semester 2024B – 2 nights with Binospec	2024
<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	
Magellan: Semester 2024B – 4 nights with FourStar/FIRE/MagE	2024
<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	
Magellan: Semester 2024A – 1 night with FourStar	2024
<i>"Infrared time-series of the oldest accreting magnetic white"</i>	
Magellan: Semester 2024A – 2 nights with MagE	2024
<i>"Novel isolated white dwarf X-ray sources from XMM-Newton"</i>	

Grants awarded

Metrics:

- \$2,345,000 in independent fellowship grants offered.
- \$659,000 of observing grants awarded for *Chandra/HST/JWST* programs as PI/Co-PI.

Grants offered for independent fellowships:

STFC Ernest Rutherford Fellowship, University of Warwick [future position]	Sept 2026–31
Awarded grant value: £777,384 (\$1,000,000)	
NASA Hubble Fellowship (STSci), Harvard University [current position]	Sept 2023–26
Awarded grant value: \$400,000	
51 Pegasi b Fellowship (Heising-Simons), The Ohio State University [declined]	2023
Awarded grant value: \$450,000	
Stephen Hawking Fellowship (EPSRC), University of Cambridge [declined]	2024
Awarded grant value: £385,000 (\$495,000)	

Grants awarded for JWST PI time:

JWST: Cycle 4 (GO 9077) – \$121,000	2025
Science PI: Cunningham , Administrative PI: Charbonneau	
JWST: Cycle 4 (GO 9111) – \$192,000	2025
Science PIs: Caiazzo/ Cunningham , Administrative PI: Charbonneau	

Grants awarded for HST Co-PI time:

HST: Cycle 32 (HST-GO-17720) – \$69,000	2024
Science PI: Caiazzo, US Science PI: Cunningham , Administrative PI: Charbonneau	

Grants awarded for Chandra PI time:

Chandra: Cycle 27 (#27300224) – \$62,000	2025
Science PI: Cunningham , Administrative PI: Hermes	

<i>Chandra</i> : Cycle 25 (#25200153) – \$120,000	2023
Science PI: Cunningham , Administrative PI: Charbonneau	
<i>Chandra</i> : Cycle 25 (#25200459) – \$60,000	2023
Science PI: Cunningham , Administrative PI: Charbonneau	
<i>Chandra</i> : Cycle 24 (#24200446) – \$35,000	2022
Science PI: Cunningham , Administrative PI: Corrales	

Professional Service

Collaborations:	2022–
- NewAthena - ESA proposed Flagship X-ray Mission: · Stars Science Working Group Member · Compact Objects Science Working Group Member · (study phase - adoption decision in 2027) - AXIS - NASA Probe Mission Concept: · Stars and Exoplanets Science Working Group Member · (selected for Phase A funding in October 2024) - Zwicky Transient Facility: · External collaborator - Stars Group - 4MOST: · Team Member of the White Dwarf Binary (WDB) Survey (PI: Toloza) - SDSS-V: · Membership through current institution	
Journal referee:	2021–
- Astronomy & Astrophysics (A&A) - Monthly Notices of the Royal Astronomical Society (MNRAS) - Monthly Notices of the Royal Astronomical Society (MNRAS) Letters - Astrophysical Journal (ApJ) - Astrophysical Journal Letters (ApJL)	
Peer Review & Time Allocation Committee Panels:	2023–
- <i>Hubble Space Telescope</i> - <i>Chandra X-ray Observatory:</i> · Deputy Chair - NASA Keck · Panel chair - FINESST: · External Reviewer - NASA ROSES: · Astrophysics Theory Program (ATP) · <i>ULTRASAT</i> – Ultraviolet Transient Astronomy Satellite Participating Scientist	
Scientific Organising Committee (SOC) – Magellan Science Meeting	2025
- EPL Carnegie, 5–7 May 2025	
Session organiser – National Astronomy Meeting 2023, Cardiff, 3–7 July	2023
- <i>“Open questions in stellar (radiation-) fluid dynamics: from dwarfs to giants”</i>	
Session organiser – National Astronomy Meeting 2022, Warwick, 11–15 July	2022

- “Know Your Neighbour: White Dwarf Researchers in the UK”
- “3D Hydrodynamics and Magnetohydrodynamics: Stars and their Environment”

Scientific Organising Committee (SOC) – Physics Days at Warwick, Warwick, 5/6 July 2021

- “Summer workshop on white dwarfs and related objects”

Session chair – National Astronomy Meeting 2019, Lancaster, 30 June–4 July 2019

- “Current Developments in Numerical Astrophysics”

Contributed Presentations

Talks.....

EuroWD24 24th European workshop on white dwarfs – [talk]	Vienna, AT August 2026
Debris Disk Connections Debris Disk Connections Workshop – [talk]	Cambridge, UK July 2026
TASC10 TASC10/KASC17 – [talk - awarded second-best talk]	Aarhus, DK July 2026
Exo VI Exoplanets VI – [talk]	Porto, PT July 2026
Hubble & Webb (VIII) Enriching the Universe: ... – [talk]	Vienna, AT April 2026
Center for Computational Astrophysics Stars & Plasma Astrophysics Group – [talk]	New York, US March 2026
Center for Astrophysics pH Lecture – [endowed colloquium]	Cambridge, MA, US February 2026
Yale University Seminar – [seminar]	New Haven, CT, US January 2026
Boston University Colloquium – [colloquium]	Boston, MA, US October 2025
NHFP Symposium - STSci NASA Hubble Fellowship Program Symposium – [talk]	Baltimore, US October 2025
Purdue University Astrophysics seminar – [seminar]	Indiana, US September 2025
University of Michigan Astrophysics seminar – [seminar]	Ann Arbor, MI, US September 2025
Harvard Origins of Life Initiative Chalk talk – [talk]	Cambridge, MA, US March 2025
AAS Meeting 245th AAS Meeting – [talk]	Maryland, US January 2025
AXIS Seminar AXIS Science Team Seminar – [talk]	Online Seminar October 2024

NHFP Symposium - Caltech <i>NASA Hubble Fellowship Program Symposium – [talk]</i>	Pasadena, CA, US <i>September 2024</i>
TANDEM Seminar Series <i>Harvard & Smithsonian Center for Astrophysics – [talk]</i>	Cambridge, MA, US <i>August 2024</i>
EuroWD24 <i>23rd European workshop on white dwarfs – [talk]</i>	Barcelona, ES <i>July 2024</i>
Institute for Science and Technology Austria (ISTA) <i>Astrophysics seminar – [seminar]</i>	Vienna, AT <i>June 2024</i>
Exo V <i>Exoplanets V – [talk, plenary session]</i>	Leiden, NL <i>June 2024</i>
NORDITA <i>Physics and Astrophysics seminar – [seminar]</i>	Stockholm, SE <i>June 2024</i>
ESAC/XMM-Newton <i>The X-ray mysteries of neutron stars and white dwarfs – [talk]</i>	ESAC, Madrid, ES <i>June 2024</i>
Caltech <i>Astronomy and Astrophysics colloquium – [colloquium]</i>	Pasadena, CA, US <i>April 2024</i>
ExSS V <i>Extreme Solar Systems V – [talk]</i>	Christchurch, NZ <i>March 2024</i>
Tufts University <i>Astronomy and Physics – [colloquium]</i>	Cambridge, MA, US <i>March 2024</i>
CfA/Harvard <i>ITC Luncheon – [talk]</i>	Cambridge, MA, US <i>February 2024</i>
UCLA <i>Astrophysics seminar – [seminar]</i>	Los Angeles, CA, US <i>February 2024</i>
NHFP Symposium - Harvard University <i>NASA Hubble Fellowship Program Symposium – [talk]</i>	Cambridge, MA, US <i>September 2024</i>
University of Exeter <i>Astrophysics Group – [seminar]</i>	Exeter, UK <i>June 2023</i>
Aspen Center for Physics <i>Conference on late-stage planetary systems – [talk]</i>	Aspen, CO <i>April 2023</i>
KITP <i>White Dwarfs as Probes of the Evolution of Planets, Stars...Universe – [talk]</i>	California, US <i>December 2022</i>
CfA/Harvard <i>High Energy Seminars, Centre for Astrophysics/Harvard & Smithsonian – [seminar]</i>	Boston, US <i>October 2022</i>
University of Cambridge <i>Exoplanet Seminar, Cavendish Astrophysics/Institute of Astronomy – [seminar]</i>	Cambridge, UK <i>October 2022</i>
Armagh Observatory & Planetarium <i>Astronomy Group – [seminar]</i>	Armagh, NI <i>September 2022</i>
UKEXOM 2022 <i>UK Exoplanet Community Meeting – [talk]</i>	Edinburgh, UK <i>September 2022</i>

EUROWD22 <i>22nd European Workshop on White Dwarfs – [talk]</i>	Tübingen, Germany <i>August 2022</i>
Ohio State University <i>Exoplanet Group – [seminar]</i>	Columbus, OH, US <i>August 2022</i>
X-ray Astronomy UK <i>X-ray Astronomy Meeting UK – [talk]</i>	Leicester, UK <i>May 2022</i>
AASTCS 9: Exoplanets IV <i>Exoplanets IV – [talk, plenary session]</i>	Las Vegas, NV, US <i>May 2022</i>
Keele University <i>Astrophysics Group Seminar</i>	Keele, UK <i>January 2022</i>
Imperial College London <i>Astrophysics Group Seminar</i>	London, UK <i>December 2021</i>
KITP <i>Transport in Stellar Interiors – [panel discussion on chemical mixing]</i>	Santa Barbara, CA, US <i>November 2021</i>
KITP <i>Probes of Transport in Stars – [talk]</i>	Santa Barbara, CA, US <i>November 2021</i>
O-MESS <i>Online - Meetings on Evolved Stars and Systems</i>	Potsdam, DE <i>June 2021</i>
KITP <i>KITP Online Reunion Conference: Exostar Redux – [talk]</i>	Santa Barbara, CA, US <i>August 2020</i>
NORDITA <i>(CANCELLED) The Shifting Paradigm of Stellar Convection: from mixing...</i>	Stockholm, Sweden <i>March 2020</i>
MPIA <i>Bergemann Stars Group Meeting</i>	Heidelberg, Germany <i>November 2019</i>
KITP <i>Bildsten Stellar Group Meeting</i>	Santa Barbara, CA, US <i>November 2019</i>
IAUS 357 <i>White dwarfs as probes of fundamental physics and...</i>	Hilo, Hawaii, US <i>October 2019</i>
CCC2019 <i>Compressible Convection Conference</i>	Newcastle, UK <i>September 2019</i>
NAM2019 <i>National Astronomy Meeting</i>	Lancaster, UK <i>July 2019</i>
EuroWD21 <i>21st European White Dwarf Workshop – [talk]</i>	Austin, TX, US <i>July 2018</i>
EWASS 2018 <i>European Week of Astronomy and Space Science</i>	Liverpool, UK <i>April 2018</i>
Posters	
Los Alamos National Laboratory (Public) <i>Current Challenges in the Physics of White Dwarf Stars</i>	Santa Fe, New Mexico, US <i>June 2017</i>
EuroWD16 <i>20th European White Dwarf Workshop</i>	Warwick, UK <i>July 2016</i>

Selected Press Coverage

- *Escaping helium atmosphere on a terrestrial planet in a nearby habitable zone* (Cherubim et al. 2026)
 - *New York Times*: Astronomers Find an Atmosphere on a Nearby Earthlike Planet
 - *BBC*: First atmosphere found on Earth-like planet in habitable zone of distant star
 - *The Guardian*: Earth-like exoplanet found to have an atmosphere
- *Super-Chandrasekhar mass SN Ia progenitor that will detonate in 23 Gyr* (Munday et al. 2025)
 - *BBC*: Two dwarf stars spotted that could explode in 22 billion years!
 - *Reuters*: Astronomers spot two white dwarfs doomed to die in a quadruple detonation
 - *Cover of Nature Astronomy*: A supernova progenitor within 50 parsecs
- *Expansion properties of the young supernova type Iax remnant Pa 30 revealed* (Cunningham et al. 2024)
 - *CNN*: A supernova first seen in 1181 is releasing glowing filaments
 - *Scientific American*: Scientists Spy a ‘Dandelion’ Supernova around a ‘Zombie’ Star
- *Spectral analysis of ultra-cool white dwarfs polluted by planetary debris* (Elms et al. 2022)
 - *NewScientist*: Planets around graveyard star were consumed before Earth was even born
 - *Independent*: New star system discovery may be oldest in our galaxy, scientists say
- *A white dwarf accreting planetary material determined from X-ray observations* (Cunningham et al. 2022)
 - *Independent*: Final moments of dead planet crashing into a white dwarf seen for the first time
 - *Vice*: Scientists have finally seen what happens to shredded worlds in deep space
- *Core crystallization and pile-up in the cooling sequence of evolving white dwarfs* (Tremblay et al. 2019)
 - *Los Angeles Times*: One day our sun will solidify into a giant crystal orb
 - *NewScientist*: Astronomers have seen dying stars slowly crystallise and turn solid

Observational Experience

Spectroscopy.....

KCWI

Keck

Program: *Observations of the type Iax supernova remnant Pa30*

Mauna Kea Observatory

(3 nights) 2023-

(PI: Fuller/Polin)

MagE

Magellan/Baade

Program: *Novel isolated white dwarf X-ray sources from XMM-Newton*

Las Campanas Observatory

(2 nights) 2023-

(PI: Cunningham)

FIRE

Magellan/Baade

Program: *Novel isolated white dwarf X-ray sources from XMM-Newton*

Las Campanas Observatory

(1 night) 2024

(PI: Cunningham)

IDS

Isaac Newton Telescope (INT)

Program: *The age-metallicity relation: constraints from white dwarf-main sequence binaries*

IAC, La Palma

(5 nights) Jul 2019

(PI: Gaensicke)

ISIS

William Herschel Telescope (WHT)

Program: *The mass ratio distribution of close double white dwarf binary stars*

IAC, La Palma

(9 nights) Sep 2018

(PI: Marsh)

Photometry.....

FourStar

Magellan/Baade

Las Campanas Observatory, Chile

(1 night) Nov 2023

ULTRACAM
New Technology Telescope (NTT)

La Silla, ESO, Chile
(6 nights) Jun 2018

ULTRASPEC
Thai National Telescope (TNT)

TNO, Chang Mai, Thailand
(8 nights) Feb 2018

Wide Field Camera
Isaac Newton Telescope (INT)

IAC, La Palma
(6 nights) Feb 2017

Leadership, Outreach and Teaching

Current Students

Sumit Maheshwari – Master’s student in Physics at University of Hamburg (2024).
– Project: *Near-infrared time-series photometric and spectroscopic studies of magnetic accreting white dwarfs*

Former Students

Will Brennom – post-Bachelors at the Harvard–Smithsonian Center for Astrophysics (2024).
– Project: *Spectroscopic observations of wide white dwarf companions to Hot Jupiter hosts*
– Now PhD student at Michigan State University.

Gracjan Sienkiewicz – second year undergraduate in Physics (2023).
– *Undergraduate Research Support Scheme, University of Warwick*
– Project: *Development of Accretion Models for White Dwarfs at Low Accretion Rates*
– Now PhD student at ISTA, Vienna.

Klemen Keršič – second year undergraduate in Physics (2021).
– *Undergraduate Research Support Scheme, University of Warwick*
– Project: *Modeling Accretion of Planetary Debris on White Dwarfs (2021)*
– Now MSci student at ETH, Zürich.

Lecturer
Undergraduate module: [Science and Music](#)

University of Warwick
2017–2023

Project supervisor
Undergraduate module: [Science and Music](#)

University of Warwick
2017–2023

Supervised projects include:

- *Data-to-sound: algorithmic sonification of images and data* (2023)
- *Quartet for the end of term: Olivier Messiaen’s modes of limited transposition* (2022)
- *Turning sound into colour: Virtual Reality and insights into chromesthesia* (2020)
- *Scriabin’s colour wheel: exploring chromesthesia with MIDI piano and C/C++* (2019)
- *Turning colour into sound: developing algorithms to ‘hear’ images* (2018)

Lab Demonstrator
Undergraduate module: First Year Laboratory

University of Warwick
2016–2018

Public Observatory Night
Center for Astrophysics

Harvard College Observatory
February 2026

Research Lecture
First Year Astrophysics Course

King’s College London
February 2018

Astronomy Group Representative
Postgraduate Staff-Student Liaison Committee

University of Warwick
2016–2018

Athena Swan Diversity Representative
Postgraduate Staff-Student Liaison Committee

University of Warwick
2016–2018

Outreach Assistant*Planterium***University of Warwick**

2017–2018

Astrophysics demonstrator*XMaS Science Gala***University of Warwick**

2017

Technical Expertise

Programming Languages: Python • IDL • Fortran • C/C++ • C# • bash

High Performance Computing: OpenMP • MPI • slurm • moab

Software (Scientific): CO5BOLD • MESA • LaTeX • Unity3D

Software (X-ray): SAS • CIAO • XSPEC • BXA

Software (Accredited): [Microsoft Office Specialist Excel 2016](#) May 2019–present

Software (Audio): Logic Pro X • Ableton Live • Sibelius

Interdisciplinary Accomplishments

Prize Winner*Astronomy Meets the Arts***University of Warwick**

2019

*Film: "A Night at the Isaac Newton Telescope"***Composer***Composition: "Immersed in soundwaves"***British Science Festival, Coventry**

2019

A piece for String Quartet, Theremin and Bass Guitar (written for Coull Quartet)

Musicianship Teacher*Centre for Young Musicians***Morley College, London**

2014–2023

Workshop Leader*Tuneworks and Refolkus***Shrewsbury Folk Festival, UK**

2018–2019

Composer–Musical Director–Performing Artist*Proper Job Theatre Company***Huddersfield, UK**

2015–2019