

# Mairi O'Brien

POSTDOCTORAL RESEARCH FELLOW · ASTRONOMY & ASTROPHYSICS

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## Professional Experience

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### University of Warwick

POSTDOCTORAL RESEARCH FELLOW

Coventry, UK

July 2025 - present

## Education

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### University of Warwick

PHD ASTROPHYSICS

- Thesis Title: White Dwarfs in the Solar Neighbourhood
- Advisor: Prof. Pier-Emmanuel Tremblay

Coventry, UK

Oct 2021 - June 2025

### Durham University

MPHYS PHYSICS & ASTRONOMY

- First Class Integrated Masters
- Masters Project: Optical variability properties of accreting white dwarfs observed with NASA's TESS satellite
- Advisor: Dr. Simone Scaringi

Durham, UK

Oct 2017 - July 2021

## Publications

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### FIRST AUTHOR

3. **M. W. O'Brien**, P.-E. Tremblay, B. L. Klein, C. Melis, D. Koester, A. M. Buchan, D. Veras, & A. E. Doyle. 2025. **Characterizing planetary material accreted by cool helium atmosphere white dwarfs using an exponentially decaying disc model.** MNRAS 539, 1, 171.
2. **M. W. O'Brien**, P.-E. Tremblay, B. L. Klein, D. Koester, C. Melis, A. Bédard, E. Cukanovaite, T. Cunningham, A. E. Doyle, B. T. Gänsicke, N. P. Gentile Fusillo, M. A. Hollands, J. McCleery, I. Pelisoli, S. Toonen, A. J. Weinberger & B. Zuckerman. 2024. **The 40 pc sample of white dwarfs with Gaia.** MNRAS 527, 3, 8687.
1. **M. W. O'Brien**, P.-E. Tremblay, N. P. Gentile Fusillo, M. A. Hollands, B. T. Gänsicke, D. Koester, I. Pelisoli, E. Cukanovaite, T. Cunningham, A. E. Doyle, A. Elms, J. Farihi, J. J. Hermes, J. Holberg, S. Jordan, B. L. Klein, S. J. Kleinman, C. J. Manser, D. De Martino, T. R. Marsh, J. McCleery, C. Melis, A. Nitta, S. G. Parsons, R. Raddi, A. Rebassa-Mansergas, M. R. Schreiber, R. Silvotti, D. Steeghs, O. Toloza, S. Toonen, S. Torres, A. J. Weinberger & B. Zuckerman. 2023. **Gaia white dwarfs within 40 pc III: spectroscopic observations of new candidates in the southern hemisphere.** MNRAS 518, 2, 8687.

### CO-AUTHOR

12. H. Dawson, M. Dorsch, S. Geier, J. Munday, M. Pritzkeleit, U. Heber, F. Mattig, D. Benitez-Palacios, M. Vučković, I. Pelisoli, K. Deshmukh, A. Bhat, L. Kufleitner, M. Uzundag, V. Schaffenroth, N. Reindl, R. Culpan, R. Raddi, L. Antunes Amaral, A. G. Istrate, S. Justham, R. H. Østensen, J. H. Telting, T. Steinmetz, N. Rodríguez-Segovia, P. Fernandez-Schlosser, A. Durán-Reyes, E. Arancibia-Rojas, M. Latour, G. T. Jones, **M. W. O'Brien**, S. Sahu, & A. Elms. 2026. **A 500 pc volume-limited sample of hot subluminous stars: II. Atmospheric parameters, mass distribution, and kinematics.** A&A 707, A6, 20.
11. S. Sahu, P.-E. Tremblay, D. Koester, **M. W. O'Brien**, S. Blouin, B. T. Gänsicke & V. Fairchild. 2025. **Re-evaluating Lyman  $\alpha$  wing opacities and the low mass-problem in cool white dwarfs.** MNRAS 544, 2, 2038.
10. T. Cunningham, P.-E. Tremblay, **M. W. O'Brien**, E. B. Bauer, M. A. Hollands, D. Koester, S. J. Kenyon, D. Charbonneau, D. Veras & M. F. Yusaf. 2025. **The dearth of high-mass hydrogen-atmosphere metal-polluted white dwarfs within 40 pc.** MNRAS 539, 3, 2021.

9. E. K. Roberts, P. -E. Tremblay, **M. W. O'Brien**, A. Bédard, T. Cunningham, C. M. Byrne & E. Cukanovaite. 2025. **Comparison of methods used to derive the Galactic star formation history from white dwarf samples**. MNRAS 538, 4, 2548.
8. P. -E. Tremblay, A. Bédard, **M. W. O'Brien**, J. Munday, A. K. Elms, N. P. Gentile Fusillo & S. Sahu. 2024. **The Gaia white dwarf revolution**. New Astronomy Reviews, vol 99.
7. A. K. Elms, N. P. Gentile Fusillo, P.-E. Tremblay, R. C. Bohlin, M. A. Hollands, S. Sahu, **M. W. O'Brien**, S. Deustua, & T. Cunningham. 2024. **A network of cooler white dwarfs as infrared standards for flux calibration**. MNRAS 534, 3, 2758.
6. J. T. Williams, B. T. Gänsicke, A. Swan, P. Izquierdo, **M. W. O'Brien**, A-M. Cutolo, & T. Cunningham. 2024. **PEWDD: A database of white dwarfs enriched by exo-planetary material**. A&A 691, A352, 19.
5. J. Munday, I. Pelisoli, P.-E. Tremblay, T. R. Marsh, G. Nelemans, A. Bédard, S. Toonen, E. Breedt, T. Cunningham, **M. W. O'Brien**, H. Dawson. 2024. **The DBL Survey I: discovery of 34 double-lined double white dwarf binaries**. MNRAS 532, 2, 2534.
4. C. López-Sanjuan, P.-E. Tremblay, **M. W. O'Brien**, D. Spinoso, A. Ederoclite, H. Vázquez Ramió, A. J. Cenarro, A. Marín-Franch, T. Civera, J. M. Carrasco, B. T. Gänsicke, N. P. Gentile Fusillo, A. Hernán-Caballero, M. A. Hollands, A. del Pino, H. Domínguez Sánchez, J. A. Fernández-Ontiveros, F. M. Jiménez-Esteban, A. Rebassa-Mansergas, L. Schmidtobreick, R. E. Angulo, D. Cristóbal-Hornillos, R. A. Dupke, C. Hernández-Monteagudo, M. Moles, L. Sodr e Jr, & J. Varela. 2024. **J-PLUS: The fraction of calcium white dwarfs along the cooling sequence**. A&A 691, A211, 16.
3. T. Cunningham, P.-E. Tremblay & **M. W. O'Brien**. 2024. **Initial-final mass relation from white dwarfs within 40 pc**. MNRAS 527, 2, 3602
2. E. Cukanovaite, P.-E. Tremblay, S. Toonen, K. D. Temmink, C. J. Manser, **M. W. O'Brien** & J. McCleery. 2023. **Local stellar formation history from the 40 pc white dwarf sample**. MNRAS 522, 2, 1643
1. S. Scaringi, P. J. Groot, C. Knigge, A. J. Bird, E. Breedt, D. A. H. Buckley, Y. Cavecchi, N. D. Degenaar, D. de Martino, C. Done, M. Fratta, K. Iłkiewicz, E. Koerding, J.-P. Lasota, C. Littlefield, C. F. Manara, **M. O'Brien**, P. Szkody & F. X. Timmes. 2022. **Localized thermonuclear bursts from accreting magnetic white dwarfs**. Nature 604, 7906, 447.

## Awards

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- |      |  |                           |
|------|--|---------------------------|
| 2024 | Warwick Award for Public and Community Engagement - Team Category, University of Warwick | <i>Coding with Sophie</i> |
| 2023 | First Prize: Physics PhD Poster Presentation, University of Warwick                      |                           |
| 2023 | Highly Commended: Excellence in Gender Equality Team Award, University of Warwick        | <i>Equitea</i>            |
| 2020 | Physics Department Award for Excellence, Durham University                               |                           |

## Telescope Time Awarded

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|------|---|--------------|
| 2026 | NIRSpec and MIRI on the James Webb Space Telescope, 75.6 hours (PI) | <i>STScI</i> |
| 2024 | STIS on the Hubble Space Telescope, 5 orbits (PI)                   | <i>STScI</i> |
| 2023 | X-shooter on the Very Large Telescope, 4.7 hours (PI)               | <i>ESO</i>   |

## Presentations

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### CONFERENCE TALKS & POSTERS

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|------|---|--------------------------|
| 2025 | Talk, National Astronomy Meeting 2025   | <i>Durham, UK</i>        |
| 2024 | Talk, EuroWD24  | <i>Barcelona, Spain</i>  |
| 2024 | Talk (virtual), Cool Stars 22   | <i>San Diego, USA</i>    |
| 2024 | Poster, Current Challenges in the Physics of White Dwarf Stars                    | <i>Santa Fe, USA</i>     |
| 2023 | Poster, Exoplanet Systems and Stellar Life Cycles: Late-Stage and Post-MS Systems | <i>Aspen, USA</i>        |
| 2022 | Talk, EuroWD22  | <i>Tübingen, Germany</i> |
| 2022 | Talk, National Astronomy Meeting 2022   | <i>Warwick, UK</i>       |

### SEMINAR TALKS

2025 **Seminar Series**, Sheffield University  
2024 **Student Discussion Talk**, Armagh Observatory  
2024 **Tuesday Lunch Talk**, UCLA

*Sheffield, UK*  
*Armagh, UK*  
*Los Angeles, USA*

## Personal Development

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### TEACHING

2021 – 2024 **Graduate Teaching Assistant**, Physics Department, University of Warwick  
2022 – 2024 **Undergraduate Exam Invigilator**, Physics Department, University of Warwick

### OUTREACH & LEADERSHIP

2023 – 2025 **Conference for Undergraduate Women in Physics (CUWiP)**, Local Organising Committee Member  
2023 – 2025 **Coding with Sophie**, Teacher  
2023 – 2024 **Postgraduate Student-Staff Liaison Committee**, Chair  
2022 – 2024 **Equitea Seminars**, Committee Member  
2022 **Warwick Astronomy Knowledge Exchange (WAKE)**, Workshop Organiser

### DEVELOPMENT

2026 **DataCamp: SQL Associate Data Analyst**, Certification  
2024 **JWST Proposal Planning Workshop, University of Edinburgh**, Participant  
2023 **Isaac Newton Telescope, La Palma, Spain**, Visiting Observer: 5 Nights  
2022 **Summer Schools in Astrostatistics & Astroinformatics, Penn State University**, Virtual Participant

## Software & Programming

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**Programming Languages**, Python, MATLAB, SQL  
**Astronomical Software**, TOPCAT, EsoReflex  
**General Software**, Microsoft Excel, LaTeX