EDWARD M. BRYANT

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RESEARCH EXPERIENCE

Mullard Space Science Laboratory, UCL – Research Fellow in Exoplanets Characterisation
June 2022 - Present

I am working to study the overall population demographics of exoplanets. Primarily I use TESS all-sky photometry for different stellar samples to perform systematic searches for exoplanets in order to measure their occurrence rates. Through this work I aim to better understand the mechanisms through which planets for an evolve.

University of Warwick – PhD in Physics October 2018 - June 2022

- I lead the operations of the NGTS working group dedicated to the high precision photometric follow-up of bright exoplanet host stars including: scheduling observations, image reduction, data analysis and transit fitting, and publication of results. This role also involves coordinating working group meetings and presenting results and future plans at consortium meetings. I also coordinate the NGTS involvement in TFOP SG1, through which to date I have contributed photometric data to nine refereed TESS exoplanet planet discovery publications.
- I run a transit search for giant planets orbiting low-mass stars using TESS light curves including: target identification, transit search with BLS, triage vetting to identify clear false positives, light curve fitting to select high quality planet candidates.
- I have on-site observing experience with HARPS at La Silla Observatory, involving the scheduling of multiple observing programs through a HARPS time share. I have experience with the usage of the ESPRESSO spectrograph at the VLT including: proposal preparation, target selection, observation planning and preparation, data reduction, and radial velocity data analysis.
- I also have extensive experience modelling exoplanet time series data including: transit light curve fitting using BATMAN and EMCEE, global modelling of photometry and radial velocities using the EXOPLANET package, use of Gaussian Processes to account for stellar activity, TTV analysis.
- My research involves frequent usage of the Python programming language for: data analysis and visualisation; global modelling of time series data; predicting future exoplanet transits for scheduling. I also have experience using MySQL to access large databases.

Oxford University July - August 2017

Studied the sizes of galaxies across a range of high redshifts and simulated JWST observations of bright redshift 7 galaxies.

Durham University July - September 2016

Helped to design a mount for measuring the critical current of a superconducting tape which was placed under two dimensional strain.

EDUCATION

University of Warwick October 2018 - June 2022

PhD Physics: Discovery and Characterisation of Transiting Exoplanets
MPAGS courses: Astronomy background reading; Astronomical Techniques, Habitability in the Universe, Scientific Computing with Python; STFC Introduction to Astronomy Course

Durham University October 2014 - July 2018

MPhys in Physics Degree Level: 1st Durham Physics Award for Outstanding Achievement Award for Best 4th Year Independent MPhys Research Project

Abingdon School September 2006 - July 2014

A-Level: Physics (A*), Maths (A*), Further Maths (A*), Chemistry (A*)
AS-Level: Spanish (A) ; 11 GCSEs at Grade A*

TEACHING EXPERIENCE

2018-2019: Electronics laboratory demonstrator for first year undergraduate Physics students.
2018-2021: Programming tutor (Python) for first year undergraduate Physics students.

RELEVANT TRAINING

June 2020: Science Communication – 4-day course on developing skills and experience for the communication and presentation of scientific research to both expert and wider public audiences.

April 2019: Team Working in a Research Environment – 3-day course on useful and best practices for collaborating effectively with different people on a wide range of projects.

October 2018: Preparing to Teach in Higher Education – 1-day introduction to methods and techniques useful for teaching.

October 2018 – December 2021: Postgraduate Award in Transferable Skills in Science – producing research plans and regular research progress summaries; critically reviewing scientific papers and seminars; presenting research in the form of talks and posters and in a form suitable for a non-technical audience; creating and maintaining travel and conference budgets and risk assessments

PUBLICATIONS

I have four first author publications and thirty-eight co-author publications, through the collection and analysis of high precision ground based photometry, in high-impact peer-reviewed journals. A full list of my publications can be found at: https://ui.adsabs.harvard.edu/public-libraries/aJQ3zfYuSbyjeb1cNwQKtQ. My lead author publications are:

May 2022: *Revisiting WASP-47 with ESPRESSO and TESS*; **Bryant, E. M.**, Bayliss, D. (2022) AJ, Volume 163, Issue 197, DOI: 10.3847/1538-3881/ac58ff

June 2021: *A transit timing variation observed for the long-period extremely low-density exoplanet HIP 41378 f*; **Bryant, E. M.**; Bayliss, D.; Santerne A. et al. (2021) MNRAS: Letters, Volume 504, Issue 1, pp. L45-L50, DOI: 10.1093/mnras/slab037

December 2020: *NGTS-12b: A sub-Saturn mass transiting exoplanet in a 7.53 day orbit*; **Bryant, E. M.**; Bayliss, D.; Nielsen, L. D. et al. (2020) MNRAS, Volume 499, Issue 3, pp. 3139-3148, DOI: 10.1093/mnras/staa2976

June 2020: *Simultaneous TESS and NGTS transit observations of WASP-166 b*; **Bryant, E. M.**; Bayliss, D.; McCormac, J. et al. (2020) MNRAS, Volume 494, Issue 4, pp. 5872-5881, DOI: 10.1093/mnras/staa1075

CONFERENCE PRESENTATIONS

August 2021: TESS Science Conference 2; **Poster**; *Detecting giant planets around low-mass stars to understand how planets form*

July 2021: National Astronomy Meeting; **Talk**; *Detecting giant planets around low-mass stars to understand how planets form*

July 2020: Exoplanets 3; **Poster**; *Ultra-High Precision Photometry with NGTS Multi-Telescopes*

November 2019: RAS Specialist Discussion Meeting; RAS, London; **Talk**; *Ultra-High Precision Photometry with NGTS Multi-Telescopes*

April 2019: UK Exoplanet Meeting; Imperial College, London; **Poster**; *Ultra-High Precision Photometry of Bright Exoplanet Hosts with NGTS*

2018 - Present: Numerous presentations at NGTS consortium meetings and Warwick Exoplanet group meetings.

INTERESTS

- Rugby - played as a member of multiple clubs over 20 years. Served as team captain over a number of years at three separate clubs. Served on club committees
- Outreach - Conducted multiple astronomy related outreach events at schools, including presenting of planetarium shows and leading Q&A sessions

REFEREES

Dr. Daniel Bayliss, Dept. of Physics, University of Warwick, d.bayliss@warwick.ac.uk
Dr. Peter Wheatley, Dept. of Physics, University of Warwick, p.j.wheatley@warwick.ac.uk
Dr. Maximilian Günther, European Space Research and Technology Centre, maximilian.guenther@esa.int