Heidi B. Thiemann

Research Experience

The Open University   **Milton Keynes, UK**
PhD Student, Astronomy Research Group, School of Physical Sciences   **2017 – 2021**
- PhD title: "Variable Stars in the SuperWASP All Sky Survey" supervised by Professor Andrew Norton and Dr Ulrich Kolb, funded by the DISCnet CDT.
- Highly skilled in observational astronomy, both photometric and spectroscopic, and in data analysis, including data reduction, spectral fitting routines, and binary and evolutionary modelling.
- 100% success rate on PI and Co-I proposals for telescope time, and E.A. Milne Travelling Fellowship.

My research focuses on various aspects of stellar variability. I used a recent reanalysis of the SuperWASP archive to discover a new type of binary star, near-contact red-giant eclipsing binaries, which may be the progenitors of red novae. I identified these objects during the creation of the *SuperWASP Variable Stars Zooniverse* citizen science project, and subsequently devised and led a successful 2 year long photometric and spectroscopic follow-up campaign to characterise the radial velocities of these low-mass giant binaries. I am currently modelling the systems and their evolutionary pathways.

Previously, my research focused on using the SuperWASP archive to investigate unique stars displaying a rotational modulation in their light curve with corresponding X-ray observations. By cross-matching with existing large data sets, I characterised the rotation-activity relation for SuperWASP and ASAS-SN field stars.

Education

University of Leicester   **Leicester, UK**
2:1 (Hons) MPhys Physics with Space Science and Technology   **2013 – 2017**
- Master's projects: Searching for Variable Sources, The Formation of Hot Jupiters.
- Third year projects: Detecting Transiting Exoplanets, Catching and Disposing of Space Junk.

Nara Women's University   **Nara, Japan**
Summer Research Programme   **August 2016**
- A scientific and cultural research programme to explore the ecology and diet of Sika deer in Nara.

Industry and Management Experience

Co-Founder and Director, Space Skills Alliance   **2019 – Present**
- Founder and director of the think tank addressing the UK space sector skills shortage. Expert in the space skills domain, and have published analysis on diversity and skills shortages in the sector.

Visiting Scientist, STFC/Rutherford Appleton Laboratory   **Summer 2019**
- Worked with the Earth Observation Department to update the Python-based Sentinel-2 cloud detection algorithm and image processor 's2cloudless' to run with Sentinel-3 inputs, including visible and SWIR.

Advisor (previously Director), SpaceCareers.uk   **2016 – Present**
- Managed a team of 10 people to build and grow SpaceCareers.uk, making it the go-to resource for the space sector, reaching over 1.5 million page views. Organised national careers events for young people.

Advisor (previously Treasurer on Executive Committee), UKSEDS   **2016 – 2019**
- Managed a team of 40 volunteer staff and organised multiple national conferences. Provided young people with opportunities to further their careers, and managed a charity budget of ~£30,000.

Journal Publications

- **Thiemann, Heidi B.**, Norton, A.J., Kolb, U.C. (in prep), *Investigation of near-contact red giant eclipsing binary stars*
- **Thiemann, Heidi B.**, Norton, A.J., Dickinson, H.J., McMaster, A., Kolb, U.C. (2021), *SuperWASP Variable Stars: Classifying Light Curves Using Citizen Science*, MNRAS
- Rawls, M. L., **Thiemann, Heidi B.**, Walkowicz, L. M., Peel, M. W., Grange, Y. G., (2020) *Satellite Constellation Internet Affordability and Need*, RNAAS
- **Thiemann, Heidi B.**, Norton, A.J., Kolb, U.C., (2020) *The stellar rotation-activity relation for a sample of SuperWASP field stars*, PASA

Other Publications (Non-Refereed)

- **Thiemann, Heidi B.**, Norton, A.J., Kolb, U.C., Dickinson, H.J., McMaster, A. (2020), *SuperWASP Variable Stars: Classifying Light Curves Using Citizen Science*, to appear in: Proceedings of ADASS (ASP)
- Dudley, J., **Thiemann, Heidi B.** (2020), *Assessing the Quality of Space Job Adverts*, Space Skills Alliance
- **Thiemann, Heidi B.**, Dudley, J. (2020), *Skills demand for early career space jobs*, Space Skills Alliance
- Dudley, J., **Thiemann, Heidi B.** (2020), *Towards a space competencies taxonomy*, Space Skills Alliance
- Robson, D., et al. (2019), *Assessing the Impact of Space School UK*, Proceedings of SSEA, pp. 138-144

Conference Posters

- *SuperWASP Variable Stars: Classifying Light Curves Using Citizen Science*, ADASS XXX **2020**
- *Red novae candidates: An investigation of long-period near-contact giant binaries*, RAS Early Career Online Poster Exhibition **2020**
- *The rotation-activity relation*, National Astronomy Meeting **2019**
- *Diversity in student space activities in the UK*, 50th Lunar and Planetary Science Conference **2019**
- *Initial results of the rotation-activity relation*, Time-Domain Astronomy: A High Energy View **2018**

Selected Talks

- *SuperWASP Variable Stars: Classifying Light Curves Using Citizen Science*, ADASS XXX **2020**
- *Red novae candidates? An investigation of long-period near-contact giant binaries*, EAS **2020**
- *Megaconstellations and Astronomy*, 2nd Summit for Space Sustainability (invited) **2020**
- *Data science in the space sector*, DISCnet Annual Showcase (invited) **2019**
- *Stellar variability in SuperWASP*, SAAO colloquia series (invited) **2019**
- *Diversity in student space activities in the UK*, National Astronomy Meeting **2019**

Teaching Experience

Maths Assessor, The Open University **2019 – Present**
- Marking maths coursework from 50 Students in Secure Environments (SiSE).

Zooniverse Project Collaborator, The Open University **2018 – Present**
- Researcher and collaborator on the *SuperWASP Variable Stars* citizen science project.

Night Duty Astronomer, The Open University **2018 – Present**
- Teaching 60 undergraduates per year to independently use the *PIRATE* telescope.

Course Facilitator, FutureLearn **Winter 2018**
- Answering questions and encouraging discussion on forums for the *In the Night Sky: Orion* MOOC.

Senior Mentor, Space School UK **2014 – Present**
- Responsible for giving lectures and leading workshops to educate 180 young people on a variety of space topics, alongside pastoral care and safeguarding. Responsible for training 2-5 Junior Mentors per year.

Supervision Experience

Summer Internship Student, SpaceCareers.uk/The Open University **Summer 2018**
- Supervised an undergraduate student for an 8 week Space Placement in INdustry (SPIN) internship, guiding them towards creating outreach and careers materials.

Observing Experience

- *1.9m Telescope (SpUpNIC)*, 14 nights, SAAO, South Africa **2019**
- *PIRATE Telescope*, 700+ hours, The Open University, Tenerife **2018 – Present**
- *piCETL Telescope*, 2 nights, Leicester, UK **2016**

Successful Observing Proposals

- *SALT (RSS)*, Co-I, 2.6 hours **2020**
- *SALT (RSS)*, Co-I, 8.5 hours **2020**
- *Liverpool Telescope (FRODOSpec)*, PI, 6.1 hours **2020**
- *Liverpool Telescope (FRODOSpec)*, PI, 6.6 hours **2020**
- *1.9m Telescope (SpUpNIC)*, PI, 14 nights **2019**
- *Liverpool Telescope (FRODOSpec)*, PI, 21.2 hours **2019**
- *SALT (RSS)*, Co-I, 9.7 hours **2019**
- *Las Cumbres Observatory (multiple instruments)*, PI, 28 hours **2019**

Funding

- *E.A. Milne Travelling Fellowship*, Royal Astronomical Society **2019**
- *Small Grants Fund*, Institute of Physics **2018**
- *Outreach Grant Fund*, University of Leicester **2015**
- *Undergraduate Conference Travel Fund*, University of Leicester **2015**

Awards and Achievements

- *ECR Online Poster Exhibition*, Royal Astronomical Society **2020**
- *Rising Star Award Finalist*, FDM everywoman in Technology **2020**
- *Outreach and Public Engagement Award*, The Open University **2020**
- *Sir Arthur Clarke Award for contributions to the space sector*, Arthur C. Clarke Foundation **2019**
- *RAS Poster Competition*, Oxford University Press **2019**
- *Invitation to the Royal Garden Party*, Department for Business, Energy & Industrial Strategy **2019**
- *Voice of the Future 2019*, The Open University **2019**
- *Future Leaders Award Finalist*, University of Leicester **2019**
- *The Dean's Award*, Nara Women's University **2016**
- *Advancing Gender Equality Award*, University of Leicester **2016**
- *Voice of the Future 2015*, Royal Astronomical Society **2015**

Key Skills

- **Observational astronomy:** Experience with 7 ground-based research telescopes (photometric and spectroscopic), focusing specifically on stellar variables. Achieved every PI and Co-I proposal submitted.
- **Observation planning:** Significant experience with planning, and data reduction, and good understanding of atmospheric seeing, image quality, and causes of image noise.
- **Scientific:** Skilled at creating and working with a range of large astronomical data sets; strong statistical analysis knowledge; continuously improving data visualisation skills.
- **Scientific computation:** 4+ years of experience with Python and git in a research context, including writing astronomy-specific programmes; some experience with C, R, Fortran.
- **Scientific data analysis:** Strong familiarity with specialised astrophysics software including: observation planning, IRAF, reduction, stellar evolution modelling, spectral synthesis, and binary component modelling.
- **General IT:** Highly competent in UNIX, and Microsoft Office. Confident in use of general software including Google Drive, Slack, LaTeX, Overleaf, and social media management tools.
- **Language:** English – native; French – intermediate; Japanese – beginner.

Service and Impact Activities

- Commissioned by the UK Space Agency to carry out the 2020 Space Census, the first national census of the UK's space workforce.
- Currently serving as a member of the Space Skills Advisory Panel (SSAP), advising the UK Space Agency on skills provision, which will be fed into the National Space Skills Institute (NSSI).
- Currently serving as a member of the Royal Astronomical Society's Optical Working Group, working on understanding and mitigating the effects of mega-constellations on astronomy.
- Currently serving as a member of the Space Universities Network (SUN), working to enhance the quality of space teaching in UK universities.
- Represented the Royal Astronomical Society and The Open University in the Voice of the Future events in the House of Commons.
- Social Media Manager for Women In Aerospace-Europe (WIA-E).

Public Engagement

- Lead the development and organisation of national competitions, events, and conferences for more than 1,500 young people interested in the space industry and space careers.
- Regular speaker for Irish primary schools as part of the *Space Speaker in your Classroom* initiative.
- Engaged with students from across the country through the *I'm a Scientist* programme.
- Founded *PubhD-OU*, an informal monthly event for academics to share their research.
- Actively engaged with STEM Ambassador events, and regular speaker for *Careers Launch* events.

Professional Affiliations

- Fellow of the Royal Astronomical Society
- Member of the Institute of Physics
- Member of Women In Aerospace - Europe
- Member of the Space Universities Network
- Member of Astronomers for Planet Earth