

BEN JAMES SUTLIEFF

CURRICULUM VITAE - 26TH NOVEMBER 2024

Institute for Astronomy,
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EDUCATION

- PhD in Astronomy** - Anton Pannekoek Institute for Astronomy, University of Amsterdam, NL 2018-2023
Thesis title: *"Bringing Exoplanets Into Sharper View: Storm Chasing on Distant Worlds"*
Supervised by Prof Jayne Birkby, co-supervised by Dr Matthew Kenworthy.
- MPhys Physics with Astrophysics, First-Class Honours** - University of Exeter, UK 2014-2018
Thesis project: *"Direct Imaging and Spectroscopy of Exoplanets"*. Supervised by Prof Sasha Hinkley.

RESEARCH EXPERIENCE

- Postdoctoral Research Associate** - Institute for Astronomy, University of Edinburgh, UK 2022 - Present
Research focused on characterising exoplanets and brown dwarfs through direct imaging campaigns in the group of Prof Beth Biller, with a focus on variability studies.
- PhD Researcher** - Anton Pannekoek Institute for Astronomy, University of Amsterdam, NL 2018-2023
PhD research focused on characterising exoplanets and brown dwarfs through direct imaging campaigns, in particular the use of novel photometric and spectrophotometric monitoring techniques to measure their atmospheric variability. Reduction and analysis of direct imaging data, developing observing & data processing techniques for vector Apodizing Phase Plate coronagraphs (vAPPs). Supervised by Prof Jayne Birkby, co-supervised by Dr Matthew Kenworthy.
- Undergraduate Researcher** - University of Exeter, UK 2016-2018
An ongoing high-contrast imaging survey exploring the link between circumstellar debris disks and giant exoplanetary companions in wide-separation orbits, using observational data collected at the W.M. Keck Observatory. Supervised by Prof Sasha Hinkley.
- Undergraduate Researcher** - University of Exeter, UK 2016
Pre-processing of data using ESO's Common Pipeline Library, for high-contrast imaging targets observed with the SPHERE instrument on the VLT. Identification of planet candidates and astrometry. Supervised by Dr Elisabeth Matthews.
- XRT-C Science & Procurement** - University of Exeter, UK 2014-2016
A student-led project to construct the eXeter Radio Telescope at Caradon (XRT-C), a 4.5m radio telescope in Caradon, Cornwall, with the goal of conducting a neutral hydrogen survey of the galactic plane.
- Data Collection** - Lockyer Technology Centre, Norman Lockyer Observatory 2012-2015
Utilising a forward-scatter radar setup to monitor the daily, seasonal and annual variation in radio meteor flux.

TEACHING & SUPERVISION

- Primary Supervisor** - University of Edinburgh, UK
- Patricia Van De Walle Suárez - Edinburgh MPhys student 2024 - Present
 - Jacob Hunter - Edinburgh Senior Honours student 2024
 - Patricia Van De Walle Suárez - Edinburgh Senior Honours student 2024
 - Anthony Atkinson - summer student, University of Edinburgh / Rice University Strategic Collaboration 2023
- Co-Supervisor** - University of Edinburgh, UK
- Kai Robertson - Edinburgh Masters Degree student 2023 - 2024
- Guest Lecturer** - Heriot-Watt University, UK
- Guest lecture on exoplanets and the direct imaging technique for Masters level astrophysics course. 2024
- Teaching Assistant** - University of Amsterdam, NL 2019-2020
- Open Problems in Modern Astrophysics, Masters course (2019 & 2020)

- Outreach Activities Module (2019 - 2020)
- Project Natuur & Sterrenkunde (Bachelors project module), Bachelors course (2019)

Mentor - Space School & Senior Space School UK, University of Leicester 2015 & 2018
Assisting with the operation of the school, teaching physics and astronomy topics to students aged 13-18. Guest lectures on exoplanets and the effects of space on the human body.

AWARDS & PRIZES

Leids Kerkhoven-Bosscha Fonds (LKBF) grant - €400 (2019), €1000 (2020) 2019 & 2020
UKSEDS Best Project Award Winner - for XRT-C, a student-led radio telescope project 2015

OBSERVATIONAL AND TECHNICAL SKILLS

Principal Investigator Proposals - VLT (8.2m)/ERIS + APP, Chile: *“Exometeorology: Searching for weather on HR 8799cde using the unique ERIS APP leakage term”* - 2 half-nights 2023

Science Co-Principal Investigator Proposals - LBT (8.4m)/NALES + 360-vAPP, Arizona, USA:

“Searching for weather on the HR 8799cde exoplanets” - 5.5 hrs 2024

“A new ground-based technique for mapping exoplanets” - 2 nights 2020

Co-Investigator Proposals:

JWST Cycle 3 NIRC2 & MIRI Coronagraphy:

“Imaging Young Sub-Jupiter Planets down to Solar-System Scales” - 212.8 hrs 2024

“From Day to Season: Constraining the Rotation Period and Obliquity of Beta Pic b with Time-resolved High-contrast Imaging” - 24.2 hrs 2024

“Super-Jupiters in our backyard: MIRI coronagraphic imaging of a massive planet/brown dwarf orbiting an M dwarf at 12pc” - 13.2 hrs 2024

JWST Cycle 2 MIRI LRS + NIRSpec:

“Clouds or Chemistry?: Pinpointing the drivers of variability across the L/T transition via the benchmark L/T binary WISE 1049AB” - 19.34 hrs 2023

VLT (8.2m)/ERIS, Paranal Observatory, Chile:

“How common are widely separated giant exoplanets in young star-forming regions?” - 11.5 hrs 2024

“Clouds vs Aurora: a unique test of variability in the T dwarf WISE J0720B” - 0.2 nights 2023

VLT (8.2m)/SPHERE, Paranal Observatory, Chile:

“How common are widely separated giant exoplanets in young star-forming regions?” - 7.0 hrs 2024

“How common are widely separated giant exoplanets in young star-forming regions?” - 3.0 hrs 2023

NTT (3.58m)/SofI, La Silla Observatory, Chile:

“Following up the first variability survey for T-type planetary mass objects” - 4.9 nights 2023

“Completing the first variability survey for T-type planetary mass objects” - 5.0 nights 2022

Magellan (6.5m)/MagAO + vAPP, Las Campanas Observatory, Chile:

“The stormy nature of a young giant exoplanet” - 1 night 2019

On-site observing experience:

VLT UT4 (8.2m)/ERIS + APP, Paranal Observatory, Chile - 2 nights Oct 2023

Magellan (6.5m)/MagAO + vAPP, Las Campanas Observatory, Chile - 1 night Nov 2019

WHT (4.2m)/ISIS + ACAM observing run, La Palma - 5 nights May 2019

Data reduction and analysis expertise related to: Direct imaging datasets (180- and 360-vAPP coronagraphs, Magellan/MagAO, LBT/NALES, VLT/SPHERE, VLT/KMOS, Keck/NIRC2, JWST/NIRC2), low-resolution spectroscopy, and time-resolved (spectro)photometry.

SERVICE TO ACADEMIA

Colloquium Organiser - Institute for Astronomy, University of Edinburgh, UK 2023-Present

Exoplanets & Solar System Journal Club Co-Chair - University of Edinburgh, UK 2023-Present

Session chair - National Astronomy Meeting 2023, Cardiff, UK Jul 2023

Chair of the *“Direct imaging as a tool to constrain the fundamental parameters, atmospheres and formation of young Jupiters”* parallel session.

Borrel Committee & Social Committee - Anton Pannekoek Institute, University of Amsterdam, NL 2019-2021

Social Media Assistant - Anton Pannekoek Institute, University of Amsterdam, NL 2019-2020

Session chair × 2 - vAPP Data Hackathon, Leiden Observatory, NL	2019
Chair of the “ <i>Data Pre-processing</i> ” and “ <i>Photometric Variability with vAPPs</i> ” sessions during the workshop.	
Co-founder and SOC/LOC - Space:Exe Conference, University of Exeter, UK	2018
Launched the first edition of a now annually occurring conference bringing together speakers and delegates from both academia and industry, with a focus on space science and astronomy research in South West England.	
Student-Staff Liason Committee - Physics & Astronomy, University of Exeter, UK	2016-2018
Working with departmental staff to deliver academic representation, solving problems related to teaching and student support.	
Outreach & Publicity Officer, Secretary - Space:Exe, University of Exeter, UK	2015-2018
A university society promoting science communication and supporting several multi-discipline physics & engineering projects, such as XRT-C and a high-altitude balloon.	
Campaign Team Member - University of Exeter Student’s Guild	2016-2017
2016 DVP International Campaign Team & 2017 Guild President Campaign Team (both successful).	
UKSEDS Assistant Outreach & Publicity Officer - UKSEDS	2015-16
UK Students for the Exploration & Development of Space. Contributed to the organisation and promotion of outreach events on a national level, including regional science festivals and the National Student Space Conference.	

SCHOOLS, CONFERENCES, & TALKS

Poster - SUPA Cormack Astronomy Meeting 2024, Dundee, UK	Dec 2024
Poster - Exoplanets 5, Leiden, NL	Jun 2024
Invited Colloquium - Keele University, Keele, UK	May 2024
Contributed Talk - Scottish Exoplanet & Brown Dwarf Meeting 2024, Glasgow, UK	Apr 2024
Poster - Extreme Solar Systems V, Christchurch, New Zealand	Mar 2024
Seminar Talk - University of Southern Queensland, Toowoomba, Australia	Mar 2024
Seminar Talk - University of Queensland, Brisbane, Australia	Mar 2024
Contributed Talk - SUPA Cormack Astronomy Meeting 2023, Glasgow, UK	Dec 2023
Thirty Minute Talk (Department Seminar) - ESO Santiago, Santiago, Chile	Oct 2023
Contributed Talk - UK Exoplanet Meeting 2023, London, UK	Aug 2023
Session Chair & Contributed Talk - National Astronomy Meeting 2023, Cardiff, UK	Jul 2023
Poster - In the Spirit of Lyot, Leiden, NL	Jun 2022
Contributed Talk - NOVA Network 2 meeting, Leiden, NL (moved to online)	Nov 2021
Poster + video - European Astronomical Society Annual Meeting, Leiden, NL (moved to online)	Jun 2021
Poster + video - STScI Spring Symposium 2021, STScI, Baltimore, USA (moved to online)	Apr 2021
Poster + video - Exoplanets III, Heidelberg, Germany (moved to online)	Jul 2020
Lorentz Center workshop: Tackling the Complexities of Substellar Objects, Leiden, NL	Feb 2020
Contributed Talk - High-Contrast Imaging post-processing (HCipp) workshop, Berlin, Germany	Jan 2020
Poster + poster pop - In the Spirit of Lyot, Tokyo, Japan	Oct 2019
Poster - Netherlands Astronomy Conference, Groningen, NL	May 2019
Session chair × 2 - vAPP Data Hackathon, Leiden Observatory, NL	April 2019
Contributed Talk - NOVA Fall School, ASTRON, Dwingeloo, NL	Oct 2018
Co-founder and Organising Committee - Space:Exe Conference, University of Exeter, UK	May 2018
Contributed Talk - National Student Space Conference, University of Surrey, UK	Mar 2018
National Student Space Conference, University of Exeter, UK	Mar 2017
National Student Space Conference, University of Surrey, UK	Feb 2015
UKSEDS Comets and Asteroids Workshop, University of Oxford, UK	Feb 2015

PUBLIC OUTREACH

Science advisor - Dirleton Planet Walk, East Lothian, Scotland, UK	Jun 2024-Present
Public talk on Exoplanets - Wells & Mendip Astronomers, Wells, UK	Oct 2024
Sidewalk Astronomy - Partial Solar Eclipse, Anton Pannekoek Observatory, Amsterdam, NL	Jun 2021
Public talk on Exoplanets - Wells & Mendip Astronomers, Wells, UK (online)	Feb 2021
Observatory tour guide - Sterrenkijkavonden, Anton Pannekoek Observatory, Amsterdam, NL	Apr 2019 - Jul 2020
Outreach team member - Partial Lunar Eclipse Event, Anton Pannekoek Observatory, Amsterdam, NL	Jul 2019

Sidewalk Astronomy - Imagine Film Festival, Amsterdam, NL	Apr 2019
Invited article; “ <i>Imaging Exoplanets</i> ” - <i>Khan Quang Do</i> national school magazine, Vietnam	Mar 2019
Outreach team member - Total Lunar Eclipse Event, Anton Pannekoek Observatory, Amsterdam, NL	Jan 2019
Outreach team member - Science Park Open Day, University of Amsterdam, Amsterdam, NL	Oct 2018
Public talk on XRT-C/Radio Astronomy - Mid-Somerset Amateur Radio Club, Shepton Mallet, UK	Jun 2018
Invited article; “ <i>Imaging Exoplanets</i> ” - <i>The Nightly Observer</i> astronomy magazine, UK	Apr 2018
Outreach team member - Sidmouth Science Festival, Sidmouth, UK	Oct 2015
Outreach team member - Wells & Mendip Astronomers Open Day, Wells, UK	Aug 2015
Outreach team member - Solar Eclipse Viewing Event (1500 attended), University of Exeter, UK	Mar 2015
Public talk on Radio Meteor Observations - Wells & Mendip Astronomers, Cheddar, UK	Aug 2014
Sidewalk Astronomy - Wells & Mendip Astronomers with Waitrose & Partners, Wells, UK	Mar 2014
BBC Points West television interview on Radio Meteor Detection - BBC Stargazing Live week, UK	Jan 2014
BBC Radio Somerset interview on Radio Meteor Detection - BBC Stargazing Live week, UK	Jan 2014
Outreach team member - BBC Stargazing Live week, Wells & Mendip Astronomers, Wells, UK	Jan 2014

LANGUAGES

Computing: Experienced in PYTHON, proficient in HTML, and working knowledge of C, IDL and VISUAL BASIC.
Spoken: English (native), Dutch (A2 level), German (Elementary Proficiency - ILR scale).

LIST OF REFERENCES

Prof. Beth Biller - bb@roe.ac.uk

Institute for Astronomy, University of Edinburgh, Blackford Hill, Edinburgh, EH9 3HJ, UK

Prof. Jayne Birkby - jayne.birkby@physics.ox.ac.uk

Astrophysics, Department of Physics, University of Oxford, Denys Wilkinson Building, Keble Road, Oxford, OX1 3RH, UK

Dr. Matthew Kenworthy - kenworthy@strw.leidenuniv.nl

Leiden Observatory, Leiden University, P.O. Box 9513, 2300 RA Leiden, The Netherlands

Dr. Jordan Stone - jordan.stone@nrl.navy.mil

Naval Research Laboratory, Remote Sensing Division, 4555 Overlook Ave. SW, Washington, DC 20375, USA

Prof. Sasha Hinkley - s.hinkley@exeter.ac.uk

Department of Physics & Astronomy, University of Exeter, Physics Building, Stocker Road, Exeter, EX4 4QL, UK

PUBLICATIONS

First Author:

4. “*Exploring the directly imaged HD 1160 system through spectroscopic characterisation and high-cadence variability monitoring*”, 2024, MNRAS

B. J. Sutcliffe; J. L. Birkby; J. M. Stone; A. Derkink; F. Backs; D. S. Doelman, M. A. Kenworthy; A. J. Bohn; S. Ertel; F. Snik; C. E. Woodward; I. Ilyin; A. J. Skemer; J. M. Leisenring; K. G. Strassmeier; J. Wang; D. Charbonneau; and B. A. Biller

3. “*Prioritizing High-Precision Photometric Monitoring of Exoplanet and Brown Dwarf Companions with JWST*”, 2024, Strategic Exoplanet Initiatives with HST and JWST White Paper

B. J. Sutcliffe; X. Chen; P. Liu; E. E. Bubb; S. A. Metchev; B. P. Bowler; J. M. Vos; R. A. Martinez; G. Suárez; Y. Zhou; S. M. Factor; Z. Zhang; E. L. Rickman; A. D. Adams; E. Manjavacas; J. H. Girard; B. Kim; and T. J. Dupuy

2. “*Measuring the variability of directly imaged exoplanets using vector Apodizing Phase Plates combined with ground-based differential spectrophotometry*”, 2023, MNRAS

B. J. Sutcliffe; J. L. Birkby; J. M. Stone; D. S. Doelman; M. A. Kenworthy; V. Panwar; A. J. Bohn; S. Ertel; F. Snik; C. E. Woodward; A. J. Skemer; J. M. Leisenring; K. G. Strassmeier; and D. Charbonneau

1. “*High-contrast observations of brown dwarf companion HR 2562 B with the vector Apodizing Phase Plate coronagraph*”, 2021, MNRAS

B. J. Sutcliffe; A. J. Bohn; J. L. Birkby; M. A. Kenworthy; K. M. Morzinski; D. S. Doelman; J. R. Males; F. Snik; L. M. Close; P. M. Hinz; D. Charbonneau

Co-Author:

11. “*Standing on the Shoulders of Giants: A Comprehensive Spectroscopic Survey of Transiting & High-Contrast Giant Planets*”, 2024, Strategic Exoplanet Initiatives with HST and JWST White Paper
M. K. Alam, E. Rickman, K. Hoch; et al. including **B. J. Sutcliffe**
10. “*Investing in the Unrivaled Potential of Wide-Separation Sub-Jupiter Exoplanet Detection and Characterisation with JWST*”, 2024, Strategic Exoplanet Initiatives with HST and JWST White Paper
A. L. Carter, R. Bowens-Rubin, P. Calissendorff; et al. including **B. J. Sutcliffe**
9. “*The JWST weather report from the nearest brown dwarfs I: multiperiod JWST NIRSpec + MIRI monitoring of the benchmark binary brown dwarf WISE 1049AB*”, 2024, MNRAS
B. A. Biller; J. M. Vos; Y. Zhou; et al. including **B. J. Sutcliffe**
8. “*The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems V: Do Self-Consistent Atmospheric Models Represent JWST Spectra? A Showcase With VHS 1256 b*”, 2024, ApJ Letters
S. Petrus; N. Whiteford; P. Patapis; et al. including **B. J. Sutcliffe**
7. “*The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems IV: NIRISS Aperture Masking Interferometry Performance and Lessons Learned*”, 2024, ApJ Letters
S. Sallum; S. Ray; J. Kammerer; et al. including **B. J. Sutcliffe**
6. “*The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems III: Aperture Masking Interferometric Observations of the star HIP 65426 at 3.8 μm* ”, 2023, submitted to ApJ Letters
S. Ray; S. Sallum; S. Hinkley; et al. including **B. J. Sutcliffe**
5. “*Applying a temporal systematics model to vector Apodizing Phase Plate coronagraphic data: TRAP4vAPP*”, 2023, Astronomy & Astrophysics
P. Liu; A. J. Bohn; D. S. Doelman; **B. J. Sutcliffe**; M. Samland; M. A. Kenworthy; F. Snik; J. L. Birkby; B. A. Biller; J. R. Males; K. M. Morzinski; L. M. Close; G. P. P. L. Otten
4. “*The vector-apodizing phase plate coronagraph: design, current performance, and future development*”, 2021, Applied Optics
D. S. Doelman; F. Snik; E. H. Por; S. P. Bos; G. P. P. L. Otten; M. Kenworthy; S. Y. Haffert; M. Wilby; A. J. Bohn; **B. J. Sutcliffe**; K. Miller; M. Ouellet; J. de Boer; C. U. Keller; M. J. Escuti; S. Shi; N. Z. Warriner; K. Hornburg; J. L. Birkby; J. Males; K. M. Morzinski; L. M. Close; J. Codona; J. Long; L. Schatz; J. Lumbres; A. Rodack; K. Van Gorkom; A. Hedglen; O. Guyon; J. Lozi; T. Groff; J. Chilcote; N. Jovanovic; S. Thibault; C. de Jonge; G. Allain; C. Vallée; D. Patel; O. Côté; C. Marois; P. Hinz; J. Stone; A. Skemer; Z. Briesemeister; A. Boehle; A. M. Glauser; W. Taylor; P. Baudoz; E. Huby; O. Absil; B. Carlomagno; and C. Delacroix
3. “*Discovery of an Edge-on Circumstellar Debris Disk around BD+45° 598: A Newly Identified Member of the β Pictoris Moving Group*”, 2021, The Astrophysical Journal
S. Hinkley; E. C. Matthews; C. Lefevre; J-F. Lestrade; G. Kennedy; D. Mawet; K. R. Stapelfeldt; S. Ray; E. Mamajek; B. P. Bowler; D. Wilner; J. Williams; M. Ansdell; M. Wyatt; A. Lau; M. W. Phillips; J. Fernandez; J. Gagné; E. Bubb; **B. J. Sutcliffe**; T. J. G. Wilson; B. Matthews; H. Ngo; D. Piskorz; J. R. Crepp; E. Gonzalez; A. W. Mann; G. Mace
2. “*Assessing the Impact of Space School UK*”, 2019, Proceedings of the 3rd Symposium on Space Educational Activities
D. Robson; H. Lau; Á. O’Brien; L. Williams; **B. Sutcliffe**; H. Thiemann; L. McCaul; G. Weaver; T. Dickens
1. “*Constraining the presence of giant planets in two-belt debris disc systems with VLT/SPHERE direct imaging and dynamical arguments*”, 2018, MNRAS
E. Matthews; S. Hinkley; A. Vigan; G. Kennedy; **B. Sutcliffe**; D. Wickenden; S. Treves; T. David; T. Meshkat; D. Mawet; F. Morales; A. Shannon; K. Stapelfeldt