

# JAMES BLAKE

## Postdoctoral Research Fellow

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## EXPERIENCE

### Postdoctoral Research Fellow

#### Department of Physics, University of Warwick

📅 May 2021 – Ongoing    📍 Coventry, United Kingdom

- **Funding:** Defence Science and Technology Laboratory (Dstl)
- Continuing to lead the DebrisWatch Programme, remotely observing the geosynchronous region with the SkyMapper Telescope, Australia
- Investigating sensor architecture designs in the context of furthering the UK's sovereign SDA capabilities

See my [department webpage](#) for further details.

### Secretary

#### Centre for Space Domain Awareness (CSDA)

📅 July 2021 – Ongoing    📍 Coventry, United Kingdom

- Carrying out organisational and administrative tasks for the CSDA

See the [CSDA website](#) for further details.

### Secretary (Steering Board)

#### Global Network On Sustainability In Space (GNOSIS)

📅 November 2019 – Ongoing    📍 Coventry, United Kingdom

- **Aim:** Bringing academics and industry together to understand and solve the issue of space debris
- Organising and managing events for 50–200 participants, including workshops, conferences and meetings
- Carrying out organisational and administrative tasks for the Steering Board
- Managing social media accounts and overseeing engagement with GNOSIS members

See the [GNOSIS website](#) for further details.

### Postgraduate Student (Research, full-time)

#### Department of Physics, University of Warwick

📅 September 2017 – April 2021    📍 Coventry, United Kingdom

- **Funding:** Science and Technology Facilities Council (STFC)
- Developed Python-based analysis pipelines to detect artificial debris in images of the geosynchronous region
- Aided the commissioning and operation of a 36 cm robotic astrograph
- Led the DebrisWatch Programme, carrying out a survey of faint geosynchronous debris with the Isaac Newton Telescope, La Palma

### Senior Outreach and Recruitment Ambassador

#### SROAS Office, University of Warwick

📅 March 2014 – April 2021    📍 Coventry, United Kingdom

- Mentored for the Sutton Scholars Programme (Sutton Trust)
- Tutored at GCSE and A Level revision bootcamps
- Planned and delivered outreach sessions for year 7–13 students

## WRITE TO

PS.011  
Department of Physics  
University of Warwick  
Gibbet Hill Road  
Coventry  
CV4 7AL  
UK

## RESEARCH PROFILE

I am a postdoctoral researcher in the Centre for Space Domain Awareness (CSDA) at the University of Warwick, UK. My work is primarily focused on the detection and monitoring of artificial space debris using optical telescopes. Alongside this, I have a keen interest in the fields of exoplanetary science and astrobiology.

## EDUCATION

### Ph.D. in Space Science

#### University of Warwick

📅 September 2017 – Ongoing

**Supervisor:** Don Pollacco (Astronomy)

**Project:** *Optical imaging of space debris in low and high altitude orbits*

### M.Phys. in Physics

#### University of Warwick

📅 September 2013 – June 2017

**Grade:** First Class Honours

**Supervisor:** Jeremy Sloan (Microscopy)

**Project:** *Characterising low-dimensional 'extreme nanowires' of phase change materials in single-walled carbon nanotubes*

**Key topics:** Mechanics, Relativity, Quantum, Electricity & Magnetism, Thermal, Geophysics, Particle, Materials, Computing, Astronomy

### A Levels & GCSEs

#### Wrenn Academy & Sixth Form

📅 September 2010 – June 2013

**A2:** Maths (A\*), Hist. (A\*), Phys. (A), Chem. (A)

**AS:** Above 4(A), Furth. Maths (A), Phil. (B)

**GCSE:** 9(A\*) incl. Maths, Phys., Eng. Lang. & 5(A) incl. Astro.

- Group leader/ night staff for 10+ summer schools and residentials
- Excellent customer service developed from campus tours and open days
- Approachable telephone manner developed from student calling
- Coordinated events for audiences of 200+ visitors
- Involved with the Brilliant Club, UniTracks and Realising Opportunities initiatives, promoting Widening Participation (WP) in local schools

## Summer Research Intern

### Department of Physics, University of Warwick

📅 2015, 2016 & 2017 📍 Coventry, United Kingdom

- Undertook three 10-week summer projects as part of the Undergraduate Research Support Scheme (URSS)
- **2015** | *Attempted detection of weather patterns on HAT-P-7b*, supervised by Don Pollacco (Astronomy) – [poster](#)
- **2016** | *Modelling the circumbinary candidate KOI-1741*, supervised by David Armstrong (Astronomy) – [poster](#)
- **2017** | *Modelling panspermia in the TRAPPIST-1 system*, co-supervised by David Armstrong (Astronomy) and Hendrik Schäfer (Life Sciences) – [poster](#)
- Extensive use of Python for data analysis and/or modelling

## Work Experience Placement

### Laser 2000 (UK) Ltd, Huntingdon

📅 August – September 2012 📍 Cambridgeshire, United Kingdom

- Received training as a prospective Sales Engineer, covering the theory and commercialisation of photonic equipment
- Entrusted with digitization of legal documents
- Research project investigating the effect of temperature on a laser beam

## MEDIA

### Press releases

2021 | **Launch of CSDA** (PI: Pollacco) – [release](#)

Launch of Centre for Space Domain Awareness, University of Warwick, UK.

2020 | **DebrisWatch I** (PI: Blake) – [release](#)

Survey of faint geosynchronous debris, reached hundreds of news outlets internationally, interviews for BBC Midlands Today, BBC Radio 5 Live, BBC CWR

2017 | **Hot Jupiter Weather** (PI: Armstrong) – [release](#)

First discovery of weather in a Hot Jupiter atmosphere, reached several hundred news outlets e.g. [NewScientist](#) – [PBS](#) – [Space.com](#) – [The Conversation](#)

### Articles and blogs

2022 | **GNOSIS**

"Striving for Precision SSA", blog post – [article](#)

2020 | **Warwick Newsroom**

"The sticky situation regarding space debris", invited feature for Warwick's Knowledge Centre – [article](#)

2019 | **The Conversation**

"Five reasons future space travel should explore asteroids", co-written with Dimitri Veras for World Asteroid Day – [article](#)

2018 | **Warwick Newsroom**

"Pondering panspermia - how life could travel through space", invited feature for Warwick's Knowledge Centre – [article](#)

### Other

2021 | **Press Briefing** (National Astronomy Meeting)

Invited as a panel member to discuss the impact of satellite constellations on astronomy and the space environment

## AWARDS



### Best Student Paper

2019 | Awarded by Prof. Brandon Jones (Uni. Texas Austin, AAS Space Surveillance Technical Committee Chair) for [best student submission](#) at AMOSTECH, Maui, Hawaii, US



### Posters in Parliament Winner

2018 | Awarded by Prof. Wyn Morgan (University of Sheffield) for most effective [poster](#) at the British Conference for Undergraduate Research – [article](#)



### Significant Contribution

2016 | Awarded by Delyth Chambers, Director of Student Recruitment, Outreach and Admissions, for outstanding commitment to outreach activities



### Best Examination Performance

2011 | Awarded the Wrenn School Shield for Best Examination Performance at GCSE level

## COURSES



### EMER-GEN

2020 | MEDB, Hawaii, US  
Mentoring from space specialists in the public and private sectors, networking and professional development, focus on innovation and entrepreneurship



### Space Debris Training Course

2019 | ESA Academy, Transinne, BE  
Selected as one of 30 participants, use of MASTER and DRAMA software, debris mitigation, space surveillance, satellite re-entry and debris removal



### Innovation to Impact (i2i)

2019 | Warwick Ventures, UK  
Enhancing research impact, communication, identifying markets and opportunities, commercialisation



### Galaxies, Stars and Planets

2012 | Open University, UK  
Completed a 10-credit course alongside A-Level studies

## ACTIVITIES

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### Teaching

2017–20 | **Laboratory Marker** – *Radio astronomy*

- Marking of notebooks for a 2<sup>nd</sup> year undergraduate laboratory experiment

2019–20 | **Python Workshop Demonstrator**

- Practical sessions for 1<sup>st</sup> and 2<sup>nd</sup> year undergraduate Python modules
- Worked with students one-to-one to help them think programmatically

2018–19 | **Student co-supervision** – *Omar Elamin & Toyaj Singh*

- Assisted with the supervision of B.Sc. project students

2017–18 | **Student co-supervision** – *Jonathan Roberts & Aharan Manoharan*

- Assisted with the supervision of M.Phys. project students

2016–18 | **Revision lectures** – *1<sup>st</sup> & 2<sup>nd</sup> year*

- Delivered revision lectures for several undergraduate modules
- Topics included quantum mechanics, thermodynamics and stellar physics

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### Outreach

2018–Ongoing | **Planetarium**

- Assisting with Warwick's portable planetarium show
- Visiting local schools and presenting a range of immersive shows
- Engaging with children and promoting STEM subjects

2015–18 | **Summer schools and residentials**

- Pastoral care of year 9–12 students across 10+ residentials
- Organised activities, presented sessions and coordinated large-scale events
- Received extensive training in safeguarding

2014–17 | **School visits**

- Delivered sessions entitled *Future Pathways*, *What are my Options?*, *Facilitating Independence*, and *Access to Higher Education*
- Engaged with year 7–12 students at 10+ Widening Participation schools across Coventry, Rugby, Leamington and Birmingham

2014–17 | **Miscellaneous events**

- Represented Warwick at various HE fairs across the UK, including UCAS fairs in Bradford and London
- Visited local Widening Participation schools for parent information evenings, careers fairs and HE awareness sessions
- Coordinated Science Campus Days for year 5–6 pupils

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### Societies

2018–Ongoing | **Royal Astronomical Society** – *Member*

2016–17 | **Warwick Astronomy Society** – *Co-founder, Vice President, Treasurer*

- Organised workshops and talks for 80+ members
- Responsible for finance and sponsorship

2016–17 | **Warwick Physics Society** – *Academic Coordinator*

- Maintained revision guides, coordinated weekly help sessions
- Organised and led revision lectures for 12 modules

2016–17 | **Outreach and Recruitment Ambassadors' Community** – *Co-founder*

- Established a platform for additional training and social events
- Organised and coordinated events for 100+ student ambassadors and staff

## COMPUTING

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🔗 [github/jblake95](https://github.com/jblake95) for projects

- **Operating systems**  
Linux, MacOS, Windows
- **Programming languages**  
Python, C, Bash
- **Selected libraries**  
NumPy, SciPy, Matplotlib, astropy, astroquery, SEP, datetime, rebound, Skyfield, ellc, emcee, pandas, json
- **Software packages**  
IRAF, SAOImage DS9, AstrolmageJ, Astrometry.net, Origin Pro, MASTER, DRAMA
- **Developer tools**  
Git, PyCharm, Geany, Spyder
- **Word processing**  
L<sup>A</sup>T<sub>E</sub>X, Microsoft Office, Libre Office
- **Common tasks**  
Data analysis, image reduction and processing, database querying, modelling and simulating

## OBSERVING

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La Palma, Canary Islands

- **Near Infra-red Transiting ExoplanetS (NITES)**  
Remote observer – Follow-up photometry for exoplanet candidates – *74 nights*
- **SuperWASP-North**  
Observations of low Earth orbit satellite passes – *19 nights*
- **14" Rowe-Ackermann Schmidt astrograph**  
Observations of geosynchronous satellites – *18 nights*
- **Isaac Newton Telescope**  
Wide Field Camera – Survey of faint geosynchronous debris – *8 nights*

Coonabarabran NSW, Australia

- **SkyMapper**  
Remote observer – Survey of geosynchronous region – *10 nights*

## ADDITIONAL ROLES

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- **Sales Assistant (Holiday Temp)**  
Blue Inc, Wellingborough  
December 2014 – June 2016
- **Tutor in Mathematics**  
Barr's Hill School, Coventry  
December 2014 – April 2015
- **Fundraiser (St John Ambulance)**  
Wesser Ltd, Carmarthenshire  
July – August 2014

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## Other

2013–20 | **Student Staff Liaison Committee**

- Platform connecting the students and staff of the Department of Physics
- Served as Secretary (2014–15) and Chair (2017–18)

## SCIENTIFIC PRESENTATIONS

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### Conference talks & posters

2021 | **Exploiting strategies to obtain high-cadence photometry** (talk)  
GNOSIS Workshop: Novel Observation Techniques, NORSS Ltd, UK – *virtual*

2021 | **Surveying GSO with the INT and a robotic astrograph** (talk)  
NAM, Uni. Bath, UK – *virtual*

2020 | **Supplementing a survey of GSO with COTS equipment** (talk & poster)  
AMOSTECH, Maui, Hawaii, US – *virtual*

2020 | **DebrisWatch: Eyes on the sky** (poster)  
RAS Poster Exhibition, UK – *virtual*

2019 | **Applying astronomical tools and techniques to SSA** (talk)  
NAM, Lancaster Uni., UK

2019 | **Optical imaging of faint GSO debris with the INT** (poster)  
AMOSTECH, Maui, Hawaii, US – [Student Award Winner](#)

2018 | **Hitching a ride on asteroids - are we the aliens?** (talk)  
ICUR, Uni. Warwick, UK, streamed to Monash Uni., AU

2018 | **Panspermia: are we the aliens?** (talk)  
BCUR, Uni. Sheffield, UK

2018 | **The Warwick DebrisWatch campaign** (poster)  
RAS Specialist Meeting, Burlington House, UK

2018 | **Modelling panspermia in the TRAPPIST-1 system** (poster)  
Posters in Parliament, Palace of Westminster, UK

2016 | **Modelling the circumbinary candidate KOI-1741** (talk)  
ICUR, Uni. Warwick, UK, streamed to Uni. Leeds, UK

2016 | **Modelling the circumbinary candidate KOI-1741** (poster)  
URSS Showcase, Uni. Warwick, UK

2015 | **Searching for weather patterns on the Hot Jupiter HAT-P-7b** (poster)  
ICUR, Uni. Warwick, UK

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### Invited talks & seminars

2022 | **The sticky issue of space debris**  
Highlands Astronomical Society – *virtual* – [recording](#)

Warwick Astronomy Society  
Armagh Observatory and Planetarium – *virtual*

Queens University Belfast – *virtual*

Trinity College Dublin – *virtual*

Heart of England Astronomical Society – *virtual*

2021 | **Getting involved with GNOSIS**

NAM, Uni. Bath, UK – *virtual*

2021 | **Monitoring the mess of near-Earth space**

Loughton Astronomical Society, UK – *virtual*

2021 | **The sticky issue of space debris**

Newbury Astronomical Society, UK – *virtual*

GoSpaceWatch, UK – *virtual*

Stratford Astronomical Society – *virtual*

Coventry and Warwickshire Astronomical Society – *virtual*

ZF Group Astronomical Society – *virtual*

2020 | **Monitoring the mess of near-Earth space**

Birmingham Astronomical Society, UK – *virtual*

SERENE Group, Uni. Birmingham, UK – *virtual*

2019 | **A watchful eye on the sky**

UC Irvine, California, US

NASA Jet Propulsion Laboratory, California, US

Warwick Aerospace Society, UK

## PROPOSALS/GRANTS

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2020 | **Dstl Fellowship**

Five-year postdoctoral fellowship supporting collaborative projects between Dstl and University of Warwick (PI: Pollacco)

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2020 | **Travel Grant (RAS)**

Travel and subsistence for the AMOS Conference, Maui, Hawaii (PI: Blake)

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2019 | **Travel Grant (Warwick Ventures)**

Travel and subsistence for the International Orbital Debris Conference (IOC), Texas (PI: Blake)

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2019 | **DASA – GEOMON**

Defence and Security Accelerator funding for conception and design of a system to monitor the geosynchronous region (PI: Pollacco)

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2018 | **EOARD–Dstl Initiative**

Funding for a studentship aimed at applying machine learning techniques to space situational awareness (PI: Pollacco)

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2018 | **Isaac Newton Telescope (ING)**

Awarded 8 nights of dark-grey time to observe the geosynchronous region (PI: Pollacco)

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2017 | **PhD Studentship (STFC)**

Full-time PhD, 3.5 years, extended by 6 months due to impact of COVID-19 (PI: Pollacco, Blake)

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2015, 16, 17 | **Research Bursaries (URSS)**

Undergraduate Research Support Scheme bursaries for subsistence during summer research projects (PI: Blake)

## REFERENCES

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Available on request.

2019 | **Warwick space debris projects**  
Warwick Astronomy and Astrophysics Group, UK

2019 | **Monitoring the mess of near-Earth space**  
Warwick Astronomy Society, UK

2018 | **The debris population at GEO and the fate of aged spacecraft**  
Warwick Astronomy Society, UK

2017 | **Extrasolar panspermia: are we the aliens?**  
Stratford Astronomical Society, UK – [article](#)

2016 | **Circumbinary planets: a closer look at Tatooine**  
Warwick Astronomy Society, UK

2016 | **Settling into university life**  
Welcome Week, Uni. Warwick, UK

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## Other contributions

2022 | **Scientific Organising Committee Member; Session Convenor**  
Space Sustainability, NAM, Uni. Warwick, UK – *virtual*

2022 | **Organiser; Chair**  
GNOSIS Sandpit: Precision SSA, Uni. Warwick, UK – *virtual*

2021 | **Session Co-Chair**  
Conjunction/Rendezvous & Proximity Operations, AMOSTECH, Maui, Hawaii, US – *virtual*

2021 | **Session Convenor**  
Space Domain Awareness, NAM, Uni. Bath, UK – *virtual*

2020 | **Session Co-Chair**  
Orbital Debris, AMOSTECH, Maui, Hawaii, US – *virtual*

2020 | **Organiser; Chair**  
GNOSIS Workshop: Precision SSA, Uni. Warwick, UK – *virtual*

2020 | **Invited Panellist**  
Alumni Panel, ICUR, Uni. Warwick, UK – *virtual*

# PUBLICATIONS LIST

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## First Author

2022 | [Looking out for a sustainable space](#) **Blake, J. A.**, *Astronomy & Geophysics*, 63:2 (Invited review, in press)

2021 | [Optical imaging of space debris in low and high altitude orbits](#) **Blake, J. A.** (PhD thesis)

2021 | [DebrisWatch I: A survey of faint geosynchronous debris](#) **Blake, J. A.**, Chote, P., Pollacco, D., Feline, W., et al., *Advances in Space Research*, 67:1, 360

2020 | [Supplementing a survey of geosynchronous debris with commercial-off-the-shelf equipment](#) **Blake, J. A.**, Chote, P., Pollacco, D., Veras, D., et al., In *Proceedings of the Advanced Maui Optical and Space Surveillance (AMOS) Technologies Conference*

2019 | [Optical imaging of the geosynchronous region with the Isaac Newton Telescope](#) **Blake, J. A.**, Chote, P., Pollacco, D., Veras, D., et al., In *Proceedings of the Advanced Maui Optical and Space Surveillance (AMOS) Technologies Conference*

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## Co-Author

2020 | [Two Transiting Hot Jupiters from the WASP Survey: WASP-150b and WASP-176b](#) Cooke, B. F., Pollacco, D., Almlaay, Y., Barkaoui, K., et al., *The Astronomical Journal*, 159:6, 255

2019 | [Precision Optical Light Curves of LEO and GEO Objects](#) Chote, P., **Blake, J. A.** and Pollacco, D., In *Proceedings of the Advanced Maui Optical and Space Surveillance (AMOS) Technologies Conference*

2018 | [Dynamical and biological panspermia constraints within multi-planet exosystems](#) Veras, D., Armstrong, D. J., **Blake, J. A.**, Gutiérrez-Marcos, J. F., et al., *Astrobiology*, 18:9, 1106

2016 | [Variability in the atmosphere of the hot giant planet HAT-P-7 b](#) Armstrong, D. J., de Mooij, E., Barstow, J., Osborn, H. P., et al., *Nature Astronomy*, 1:1, 1