

Samuel Shilling

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RESEARCH INTERESTS

- Using Bayesian inference to model gamma-ray burst afterglows and associated astrophysical transients
- Using gamma-ray burst afterglows as cosmological probes of the early universe
- Understanding the physics driving empirical correlations observed in GRB afterglows
- Identifying and modeling off-axis afterglows detected with LSST

EMPLOYMENT

Researcher, Astrophysics Jun. 2024 - Dec. 2024
NASA Goddard Space Flight Center, MD, USA
Supervisor: Dr. Judith Racusin

EDUCATION

Ph.D., Astrophysics Oct. 2023 - Apr. 2027
Lancaster University, UK
Supervisor: Dr. Samantha Oates

MPhys (1st class), Physics and Astrophysics Sep. 2019 - Jun. 2023
University of Sheffield, UK
Supervisor: Prof. Clive Tadhunter

RELEVANT TECHNICAL SKILLS

- Scientific computing using Python, Linux and Git
- Developing data processing pipelines
- Quantitative data analysis and data visualisation
- Statistical inference and uncertainty estimation
- Simulating astrophysical transient light curves
- Bayesian inference for numerical model fitting

ADDITIONAL ACTIVITIES

- Postgraduate teaching assistant for undergraduate physics courses at Lancaster University (3 years)
- Chaired the Lancaster University astrophysics journal club in rotation (3 years, ongoing)
- Co-supervised masters student projects at Lancaster University (1 year, ongoing)
- Swift/UVOT burst scientist (3 years)
- Burst advocate scientist for stargate (2 months, ongoing)
- Author or co-author of 36 GCN Circulars for GRB followup observations

CONFERENCES

- *Measurements of the geometric properties of GRBs and their implications on the luminosity—decay correlation.*
Oral presentation at the Cosmic Explosions meeting, 2026. University of Cambridge, UK.
- *The intrinsic luminosity—decay correlation in subsamples of GRB X-ray afterglows.*
Oral presentation at the National Astronomy Meeting, 2026. University of Birmingham, UK.
- *Evidence of an intrinsic luminosity—decay correlation in GRB radio light curves.*
Poster presentation at the 11th Fermi symposium, 2024. University of Maryland, College Park, MD, USA.
- *An intrinsic luminosity—decay correlation in GRB radio light curves.*
Oral presentation at the UK Transients meeting, 2024. University of Leicester, UK.

REFERENCES

Dr. Samantha Oates Physics Department Lancaster University Lancaster LA1 4YB, UK s.r.oates@lancaster.ac.uk	Dr. Judith Racusin Astrophysics Science Division NASA Goddard Space Flight Center Mail Code 661, Greenbelt MD 20771, USA judith.racusin@nasa.gov	Dr. Gavin Lamb Astrophysics Research Institute Liverpool John Moores University Liverpool L3 5RF, UK, g.p.lamb@ljmu.ac.uk
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PUBLICATIONS

First author

Shilling et al. (in prep.) *The geometric properties of GRBs*. In preparation (est. 2026-2027).

Shilling et al. (2026) *The intrinsic luminosity–decay correlation in subsamples of GRB X-ray afterglows*. Submitted to MNRAS.

Shilling et al. (2025) *Evidence for an intrinsic luminosity-decay correlation in GRB radio afterglows*. MNRAS, 542:2421

Co-author

Turnbull et al. (in prep.) *The Oates Relation: testing a structured jet origin*. In preparation (est. 2027).

– My contribution: The project is ongoing. So far, I have contributed to the method and approach, and provided insight in simulating a realistic population of light curves.

Gupta et al. (2026) *Early Optical Follow-up of Gamma-Ray Bursts: The Critical Role of Robotic Telescopes*. Submitted to arXiv.

Gupta et al. (2026) *Extremely Luminous Optical Afterglow of an Energetic Gamma-Ray Burst GRB 230204B*. ApJ, 997:246.

– My contribution: I contributed to the physical interpretation of this event in the context of radio afterglows.

Miller et al. (2025) *The La Silla Schmidt Southern Survey*. PASP, 137:9.

Levan et al. (2025) *Fast X-ray transient EP240315A from a Lyman-continuum-leaking galaxy at $z \approx 5$* . Nature Astronomy, 9:1375-1386.

Gupta et al. (2024) *Deciphering the Physical Origin of GRB 240825A: A Long GRB Lacking a Bright Supernova*. Submitted to ApJ.