Mr. Christian Kirkham, FRAS

✉ cjk55 [at] cam.ac.uk   christian-k-0a3699216
🌐 http://astrochristian.github.io/

Education

2022 – Present	**Ph.D., University of Cambridge** Physics
	Thesis title: *Foreground Modelling using Bayesian Techniques for 21-cm Cosmology*.
2018 – 2022	**MPhys., Durham University** Physics with Astronomy.
	Awarded first class degree with honours.

Employment History

Oct 2024 – Mar 2025	**Demonstrator for Part IA Scientific Computing Module** Department of Physics, University of Cambridge
Oct 2023 – Jun 2024	**Supervisor for Part II Stellar Dynamics and Structure of Galaxies Module** Institute of Astronomy, University of Cambridge
Jan 2023 – Mar 2023	**Demonstrator for Part IB Introduction to Computing Module** Department of Physics, University of Cambridge
Oct 2022 – Mar 2023	**Demonstrator for Part IA Scientific Computing Module** Department of Physics, University of Cambridge
Sep 2021	**"Developing a Remote Operation Mode for the TARA Radio Telescope"** Centre for Extragalactic Astronomy, Durham University

Research Publications

- G. V. C. Allen, S. Pegwal, D. I. L. de Villiers, and **The REACH Collaboration**, *In Situ Receiver Circuit Modelling and Inference for High Precision 21 cm Radio Astronomy*, in prep.

    – *REACH collaboration member.*

- M. Bucher, **C. J. Kirkham**, E. de Lera Acedo, D. I. L. de Villiers, and S. Pegwal, *Global 21-cm Measurement Calibration Methodology*, in prep.

    – *Generated simulated receiver data and applied the calibration equations to the mock dataset to allow for effective comparison of the methods.*

- **C. J. Kirkham**, D. J. Anstey, and E. de Lera Acedo, *Capturing System Drift with Time Series Calibration for Global 21-cm Cosmology Experiments*, Sep. 2025. doi: 10.48550/arXiv.2509.13010. arXiv: 2509.13010 [astro-ph].

- S. A. K. Leeney, H. T. J. Bevins, E. de Lera Acedo, W. J. Handley, **C. J. Kirkham** et al., *Radiometer Calibration using Machine Learning*, Oct. 2025. Sci Rep, 15, 34335 (2025). doi:10.1038/s41598-025-16732-9

    – *Provided helpful discussion and advice to the lead author.*

- **C. J. Kirkham**, W. J. Handley, J. Zhu, K. Artuc, I. L. V. Roque et al., *Accounting for Noise and Singularities in Bayesian Calibration Methods for Global 21-cm Cosmology Experiments*, Oct. 2025. MNRAS, Accepted Manuscript. doi:10.1093/mnras/staf1715

- **C. J. Kirkham**, D. J. Anstey, and E. de Lera Acedo, *A Bayesian Method to Mitigate the Effects of Unmodelled Time-Varying Systematics for 21-cm Cosmology Experiments*, Jan. 2024. MNRAS, 527, 8305. doi:10.1093/mnras/stad3725

Skills

Research	▐	21-cm Radio Cosmology, Bayesian statistics, Microwave engineering, Nested sampling, Gaussian processes, Time-series analysis
Languages	▐	Strong reading, writing and speaking competencies in English
Coding	▐	Python, JAX, LaTeX, Git, UNIX, HPC
Web Dev	▐	HTML, CSS, JavaScript
Misc.	▐	Teaching, LaTeX typesetting and publishing.

Talks

Conference and Workshop Talks

Nov 2025	▐	**"Capturing System Drift with Time Series Calibration for REACH"** REACH Annual Meeting, University of Cambridge, Cambridge, UK
Sep 2025	▐	**"An Overview of Methods for REACH Calibration"** Global 21-cm Workshop, California Institute of Technology, Pasadena, USA
Jul 2025	▐	**"Modelling Drifts in Receiver Calibrations for Global 21-cm Cosmology Experiments"** Radio Cosmology and Science with the 21-cm Signal, University of Cambridge, Cambridge, UK
Apr 2025	▐	**"Accounting for Noise and Singularities in Bayesian Calibration Methods for Global 21-cm Cosmology Experiments"** Friday Lunchtime Astronomy Talk, Durham University, Durham, UK
Feb 2025	▐	**"Accounting for Noise and Singularities in Bayesian Calibration Methods for Global 21-cm Cosmology Experiments"** Hills Coffee Talk, University of Cambridge, Cambridge, UK
Sep 2024	▐	**"An Overview of Bayesian Noise Wave Methods for Calibration of REACH"** REACH Annual Meeting, Mahabaleshwar, India
May 2024	▐	**"Gaussian Processes for Systematic Mitigation"** URSI AT-RASC, Gran Canaria, Spain
Feb 2024	▐	**"Gaussian Processes for Mitigating Systematics in Global 21-cm Cosmology Experiments"** Institute of Astronomy Wednesday Seminar, University of Cambridge, Cambridge, UK
	▐	**"Gaussian Processes for Mitigating Systematics"** Science with the 21-cm line, Kavli Science Focus Meeting, University of Cambridge, Cambridge, UK
Sep 2023	▐	**"A Bayesian Method to Mitigate the Effects of Unmodelled Time-Varying Systematics for 21-cm Cosmology Experiments"** REACH Annual Meeting, University of Malta, Valetta, Malta

Poster Presentations

Oct 2024	▐	**"A Marginalised Bayesian Noise Wave Calibration Method for Global 21-cm Cosmology Experiments"** Global 21-cm Workshop, Raman Research Institute, Bengaluru, India
Mar 2024	▐	**"A Bayesian Method to Mitigate the Effects of Unmodelled Time-Varying Systematics for 21-cm Cosmology Experiments"** Cosmology in the Alps, Les Diablerets, Switzerland

Awards

2025	▐	**College Senior Scholarship**, Fitzwilliam College, Cambridge
2024	▐	**College Senior Scholarship**, Fitzwilliam College, Cambridge

Awards (continued)

2019   █ **Physics Award for Outstanding Achievement**, Durham University

References

Available on Request