TOBY LOVICK
github.com/tobylovick

EDUCATION

University of Cambridge *2024 –*
PhD in Data-Intensive Science, Institute of Astronomy
Supervisor: Prof. Will Handley.

University of Cambridge, Pembroke College *2019 – 2023*
MSci in Astrophysics, First Class with Distinction, 88/100
BA in Natural Sciences (Astrophysics), First Class

PUBLICATIONS

- **T. Lovick**, D. Yallup & W. Handley (2026). *Automatic Laplace Collapsed Sampling: Scalable Marginalisation of Latent Parameters via Automatic Differentiation.* arXiv:2603.26644.
- **T. Lovick**, D. Yallup, D. Piras, A. Spurio Mancini & W. Handley (2025). *High-Dimensional Bayesian Model Comparison in Cosmology with GPU-accelerated Nested Sampling and Neural Emulators.* In review, Open Journal of Astrophysics. arXiv:2509.13307.
- **T. Lovick**, S. Dhawan, W. Handley et al. (2024). *Non-Gaussian Likelihoods for Type Ia Supernovae.* Monthly Notices of the Royal Astronomical Society. arXiv:2312.02075.

GRANTS & AWARDS

Harding Distinguished Postgraduate Scholars Programme 2024 – 2028

Full PhD scholarship with £6000 additional research budget. Approximately 40 awards made annually to exceptional PhD students across the university.

Dr Stevens Prize, Pembroke College, University of Cambridge 2023

£300; awarded for the highest-scoring Natural Sciences degree in Pembroke College.

Institute of Astronomy MASt/Part III Bursary 2023

£3500; funded a summer internship converting my MSci thesis to a published paper.

TALKS

Slides: github.com/tobylovick/talks

Invited:

· KiCC CMB/LSS Seminar, Institute of Astronomy, Cambridge *2025*
High-Dimensional Bayesian Model Comparison for Weak Lensing

· IoA Ia SNe group, Institute of Astronomy, Cambridge *2024*
Non-Gaussian Likelihoods for Type Ia SNe Analysis

Contributed:

· Handley Group Meeting, Kavli Institute for Cosmology, Cambridge *2023 –*
∼6 presentations on nested sampling, GPU inference, and ALCS

· Wednesday Seminar Series, Institute of Astronomy, Cambridge *2025*
High-Dimensional Bayesian Model Comparison in Cosmology

TECHNICAL EXPERIENCE

- **Languages:** Python, MATLAB
- **Libraries:** JAX, BlackJAX, PyTorch, NumPy, SciPy, MatPlotLib
- **Methods:** Nested sampling, GPU parallelisation, high-performance computing, continuous optimisation, neural network emulators, analytical marginalisation.

TEACHING

University Supervisor, University of Cambridge 2024 –

- Relativity (Part II, 3rd year)
- Mathematical Methods (Part IB, 2nd year)
- Oscillating Systems (Part IA, 1st year)

COMPOS Tutor, Oxford University 2023 – 2024

- Small-group extra-curricular physics and mathematics for sixth-form students

Private Tutor 2017 –

- Mathematics and physics; GCSE, A-level, and university admissions tests (STEP, MAT)

OUTREACH

- **Bayesian Inference Tutorial Series** (online, open access) *2025 –*
  Covering conditional probability through to GPU-accelerated implementations, with cosmological and pedagogical examples. Written to support informal teaching of Bayesian methods to new group members and peers.
- **Pembroke College Stokes Society** *2026*
  Poster presentation and talk on cosmological inference, for an undergraduate/alumni audience, showcasing science at Pembroke.