PHILIP HOLLOWAY

Research Fellow in Strong Gravitational Lensing

Institute of Cosmology and Gravitation, Portsmouth, PO1 3FX

Education:

10/2021-07/2025:	**DPhil Astrophysics** **Balliol College, University of Oxford** *Thesis: Strong Gravitational Lenses in the Era of Wide-Field Surveys* *Supervisor: Dr Aprajita Verma*
10/2017-8/2021:	**BA, MSci, Astrophysics (First Class)** **Clare College, University of Cambridge** *Master's Thesis: Measuring the Impact of Satellite Mega-Constellations over Wide Area Telescopes*

Research Experience:

09/2025-present:	**Research Fellow in Strong Gravitational Lensing,** Institute of Cosmology and Gravitation, University of Portsmouth
10/2021-07/2025:	**DPhil Astrophysics**, University of Oxford
03/2023-09/2023:	**Visiting Student,** SLAC National Accelerator Laboratory, CA, USA. 6-month attachment in the KIPAC strong lensing group.
07/2019-09/2019:	**Research Internship**, Institute of Astronomy, University of Cambridge

Awards:

2026:	**University of Portsmouth 'Living Our Values' award:** *Awarded for my organisation and hosting of an international conference of researchers in the Euclid collaboration.*
2025:	***Euclid* STAR prize:** *Team Science category, for contributing to the Strong Lensing Discovery Engine*
2020:	**Foundation Scholarship for One Year:** *1st at the end of third year and at least a 2.i in the previous year.*
2018, 2019, 2020:	**Clare College Prize:** *Achieving a 1st in the end of year examination*

Recent Presentations:

- April 2026: Euclid Strong Lensing Meeting, ICG, Portsmouth: *Lens finding and modelling with Euclid DR1*
- **Invited Talk:** May 2025: Royal Astronomical Society, London, UK: *Strong Lens Finding: Citizen Science and Ensemble Classification*
- July 2024: DESC Collaboration Meeting, Zurich, Switzerland: *Lens Modelling and Cosmological Inference from an Impure Sample of Strong Lenses*

- March 2024: RubinStrongLensing24 Conference, Oxford, UK: *Strong Lens Finding and Cosmological Inference in the Era of Wide-area Surveys*
- September 2023: KIPAC '*Tea Talk',* SLAC, USA: *Uncertain Galaxy-Scale Lens Discovery in the Era of LSST*
- June 2023: IAU Conference, Italy: *Lens Discovery in the Era of Wide-area Surveys (Poster)*

Widening Participation and Public Outreach

- I have enjoyed extensive engagement with citizen scientists as part of lens-finding projects, through the *Space Warps* collaboration.
- Recognising the need to widen access into the physics profession, I have enjoyed participating in workshops for schools aimed to encourage underrepresented groups to apply for physics degrees.
- During my PhD I designed a 'Strong Lensing Toolkit', to illustrate the nature of gravitational lensing to the wider public which I first demonstrated at a science fair this summer.
- I undertook a graduate course on Public Engagement with Research (2023-2024)
- During the Coronavirus pandemic, I provided physics tuition within the Coronavirus Tutoring Initiative, which provided free tuition to underprivileged school pupils affected by school closures.

Code Development

I am a contributor to the *SLSim* strong lensing pipeline and *paltas*, a package for simulation based inference with strong lenses. I have also contributed to and implemented an automated pipeline for analysis of citizen science classifications, *kSWAP*.

Positions of Responsibility

- I am currently the Post-doc representative in my research department, for which I represent postdoctoral researchers at departmental management meetings, communicating their concerns and feedback to senior management.
- Throughout my PhD I co-supervised master's students undertaking strong lensing projects, ensuring that they are well supported and the tasks they are set are explained clearly.
- In March 2024, I facilitated the organization of the RubinStrongLensing24 conference in Oxford.
- During my PhD I co-ran a regular 'LSST coffee' in my department, to foster discussion and collaboration in LSST projects.
- Panel member for LSST SLSC Builder Status (2024–25)
- Reviewer for A&A, MNRAS,ApJ and ApJS.

Collaboration Membership

I am a keen and active member in the *LSST* Dark Energy and Strong Lensing Science Collaborations (DESC, SLSC)*, the Euclid* Collaboration and *Space Warps,* a collaboration which uses citizen science to identify strong gravitational lenses.

Skills

I am fluent in Python with experience of machine learning (e.g. *Tensorflow*), auto-differentiation methods (e.g. *JAX*) and strong lens modeling (e.g. *pyAutolens* and *paltas*). I have used MATLAB and R in previous projects. During my PhD I attended a lecture course on machine learning and the 2023 SLAC Summer Institute workshop with the same theme, which further enhanced my skills in this area.

Submitted/Accepted Publications:

- Euclid Collaboration: **Holloway P,** Verma A., Walmsley M et al. (2026, A&A, A&A, 711, A30)
  Euclid Quick Data Release (Q1): The Strong Lensing Discovery Engine E - Ensemble classification of strong gravitational lenses: lessons for Data Release 1

- Euclid Collaboration: Walmsley M., **Holloway P.** et al. (2026, A&A, 711, A26)
  Euclid Quick Data Release (Q1): The Strong Lensing Discovery Engine A - System overview and lens catalogue

- **Holloway P**., Verma A., Marshall P. J. et al. (submitted to MNRAS, arXiv:2609.21699)
  Lens Modelling and Cosmological Inference from an Impure Population of Strong Lenses

- Gonzalez J., **Holloway P.,** et al. (2026, ApJ, 1002, 116)
  Discovering Strong Gravitational Lenses in the Dark Energy Survey with Interactive Machine Learning and Crowd-sourced Inspection with Space Warps

- **Holloway, P.,** Marshall P. J., Verma A. et al. (2024, MNRAS, 530, 1297)
  A Bayesian Approach to Strong Lens Finding in the Era of Wide-area Surveys

- **Holloway P.,** Marshall P. J., Verma A. (2024, Conf. Proceedings, IAUS, 381, 35)
  Lens Discovery in the Era of Wide-area Surveys

- **Holloway P**., Verma A., Marshall P. J. et al. (2023, MNRAS, 525, 2341)
  On the Detectability of Strong Lensing in Near-Infrared Surveys