JOB DESCRIPTION

Job Title:	Research Fellow in Cosmology
Directorate/Department:	Physics
Job type:	Professional Services – Full time, Fixed term
Grade:	RHUL 7
Accountable to:	Principal Investigator
Accountable for:	N/A

Purpose of the Post

This position is funded by a Leverhulme Trust Research Leadership Award and will support research within the ECLIPSE project. The successful candidate will work on developing next-generation inference frameworks for cosmology, with a focus on understanding dark energy and modified gravity using data from the *Euclid* satellite mission.

The research will involve techniques such as differentiable programming and emulation to tackle key challenges in cosmological data analysis. The successful candidate will be expected to become an active member of the *Euclid* Consortium. The *Euclid* space telescope was launched in July 2023, and the Consortium is currently preparing its cosmology analyses for upcoming data releases, aligning well with the timeline of this position.

Key Tasks

1. Contribute to the development of novel inference methods for cosmological data analysis, including using differentiable programming and emulation techniques
2. Support the development and application of the project's inference pipeline to *Euclid* data products (e.g. weak lensing and/or galaxy clustering), in collaboration with *Euclid* Consortium partners
3. Take part in the academic life of the ECLIPSE centre, the Astronomy group and the Physics Department (e.g. attending seminars and journal club)
4. Plan and manage your own research programme and associated administrative duties, including light-touch project coordination across multiple strands of work to ensure timely delivery against milestones
5. Lead the drafting, submission, and revision of peer-reviewed publications, working collaboratively with the wider team
6. Assist with the supervision of undergraduate and graduate students
7. Use initiative and creativity to identify areas for research, developing new research methods and extending the research portfolio
8. Take a leading role in overcoming methodological problems that arise during the project lifespan, and keep the PI up to date with the project's progress
9. Prepare and present findings of research activity to colleagues and at scientific meetings

Other Duties

The duties listed are not exhaustive and may be varied from time to time as dictated by the changing needs of the University. The post holder will be expected to undertake other duties as appropriate and as requested by their manager.

The post holder may be required to work at any of the locations at which the business of Royal Holloway is conducted.

Our Values

Advancing equity and inclusion is central to our identity as a University of Social Purpose, guided by our values of being Respectful, Innovative, Open, and Daring. We strive to build a fair and inclusive environment for all colleagues and students, where we challenge ourselves and others with integrity, and approach difference with understanding and kindness. Every member of our community is expected to treat others with dignity, work collaboratively across a wide range of backgrounds and perspectives, and contribute to a place where everyone can participate fully and feel valued.

PERSON SPECIFICATION

Details on the qualifications, experience, skills, knowledge and abilities that are needed to fulfil this role are set out below.

Job Title: Research Fellow in Cosmology **Department:** Physics

	Essential	Desirable
Knowledge, Education, Qualifications and Training		
PhD in Physics, Astronomy or other relevant subject area (or near completion - it is expected that the appointee will have their PhD awarded within 4 months of the start date))	X	
Demonstrable comprehensive knowledge in the subject area	X	
Proven knowledge of statistical inference / ML methods relevant to cosmology		X
Skills and Abilities		
Excellent programming skills and proficiency with software version control (e.g. GitHub)	X	
Excellent communication skills	X	
Experience with differentiable programming frameworks (e.g. JAX, PyTorch)		X
Experience analysing cosmological datasets and/or simulations		X
Experience working with HPC / large-scale computing workflows		X
Experience		
Evidence of a strong publication record (commensurate with career stage)		X
Experience of supervising undergraduate and graduate students		X
Experience working in a large scientific collaboration		X
Other Requirements		
Ability to work independently and manage time to meet deadlines	X	
Intellectual curiosity and openness to cross-disciplinary approaches, including keeping abreast of relevant developments in statistical inference, machine learning, and other data-intensive sciences		X