Euclid Visible Imager Instrument Scientist
at
Mullard Space Science Laboratory, University College London

Ref: 1150503

CONTEXT

This post is within the Astrophysics Group (www.ucl.ac.uk/mssl/astro) in the Department of Space and Climate Physics (www.mssl.ucl.ac.uk) at Mullard Space Science Laboratory. For administrative purposes the Department is part of the UCL Faculty of Mathematical and Physical Sciences (MAPS). The post-holder will report to Prof Mark Cropper.

UCL is one of the leading multi-faculty universities in Europe. It has a long and distinguished tradition, having been founded in 1827 as the original University of London. It was the first English university to admit students without regard to their religious affiliation, and the first to admit women and men on equal terms. UCL has excelled in both physical sciences (it had the first teaching laboratory for physics in an English university and four of the elements were discovered at UCL) and biomedical sciences (and is now the heart of one of the largest biomedical research complexes in Western Europe). Twenty one Nobel prizes have been awarded to its staff or graduates and twenty five faculty members are currently on the ISI Most Highly Cited list. It was recently ranked as the 4th best university in the world by the Sunday Times Higher Education Supplement. The Centre for Science & Technology Studies at Leiden University ranked UCL as the second most productive European university (after Cambridge) and the third most highly cited in 2007. The College currently has more than 4000 academic and research staff and 22,000 students, more than a third of whom are postgraduates. Although part of the federal University of London, the College has a very high degree of financial and managerial autonomy, and its annual income is in excess of £600 million.

Mullard Space Science Laboratory is the Department of Space & Climate Physics at UCL (www.mssl.ucl.ac.uk) and is located on its own campus in the beautiful Surrey Hills, surrounded by woodland. MSSL is the UK’s largest university space research group. Space science is a discipline that demands highly innovative technologies and MSSL has an international reputation for excellence in this area. UCL was one of the first universities in the world to become involved in making scientific observations in space. Since MSSL was established in 1966, we have participated in over 40 satellite missions with the European Space Agency, NASA (US), Japan, Russia, China and India, and flown over 230 rocket experiments. The total staff complement is approximately 140, of which are 35 academic staff, fellows and postdocs. The Astrophysics Group consists of 25 members, including postgraduate students. We have the unique capability of designing, building and testing instruments and other spacecraft systems on site. Our research scientists and development engineers work together to ensure that the instruments we produce are as relevant as possible and that the subsequent data analysis benefits from a fundamental understanding of the instruments’ individual responses. MSSL has more than a dozen instruments operating in orbit, addressing science in astronomy/astrophysics, Solar and space plasma physics. The most recent launch was Herschel, where MSSL provided significantly to the SPIRE instrument. Current projects undergoing hardware development in the astronomy/astrophysics area include JWST (NASA), Gaia (ESA), Astrosat (India), PLATO (ESA) and Euclid (ESA).
The Astrophysics group has a strategic programme of astronomy research where we exploit the data provided by astrophysics facilities in which we have made a key investment (XMM-Newton, Swift, Herschel), and which supports our hardware involvement and scientific exploitation of future key space astrophysics facilities (JWST and Gaia, and the Euclid and PLATO missions under study for ESA’s Cosmic Vision programme). For this reason, our astrophysics programme is multi-wavelength, multi-facility, and makes the best of both ground-based and space-based instrumentation. We have a strong theoretical element to complement our observational research with theoretical research and modelling.

Euclid (see [http://sci.esa.int/science-e/www/area/index.cfm?fareaid=102](http://sci.esa.int/science-e/www/area/index.cfm?fareaid=102)) is one of three missions in the final stage of selection for Cosmic Visions ending in June 2011, after which two missions will be chosen for launch in 2017/18. MSSL has a strong role in the mission, leading the visible instrument (VIS), which is a large optical-band imager with 30-36 CCDs, providing 0.23 arc second spatial resolution to very faint limits (R~25 at 10σ). This will survey the entire extra-Galactic sky, covering 20000 deg² in a 5 year mission.

Euclid is designed to make the most exquisitely accurate measurements of Dark Energy, to explore what it is, and to quantify precisely its role in the evolution of the Universe. Euclid will additionally measure directly the distribution of Dark Matter and illuminate its nature. In the current "concordance model" of the Universe, three quarters of its mass consists of Dark Energy, and one fifth of Dark Matter. If, instead, the concordance model is incorrect, our fundamental ideas about gravity will need revision: Euclid will also test the validity of many of these modified gravity theories. We stand at the threshold of a new conceptual understanding of the physical universe, as the subject did a century ago when classical physics was transformed by general relativity and quantum mechanics, and Euclid will be one of the most powerful facilities in this quest.

Besides these studies in physics and cosmology, Euclid will provide a truly colossal legacy dataset over the whole sky. It will be used by scientists worldwide in a wide range of contexts, and it will have huge scientific and public impact.
JOB DESCRIPTION

Job Title

Euclid Visible Imager Instrument Scientist

Department

Department of Space & Climate Physics, Mullard Space Science Laboratory, University College London.

Grade

Research Grade 7 (salary in the range £28983 to £35646). The appointment level will be commensurate with accomplishment and experience.

Reports to

Prof Mark Cropper.

Summary of Job Function

The post holder will be a key member of the MSSL team developing the Euclid Visible Instrument (VIS) within the Euclid Consortium. (S)he will provide the scientific expertise required to maximise the science return from the instrument within the engineering and operational constraints.

Main Duties and Responsibilities

The post-holder will be expected to:
- represent scientists’ interests within the Euclid-VIS team;
- liaise with scientists in the broader community and incorporate within VIS the simulations and techniques developed by them;
- carry out performance modelling;
- develop calibration strategies;
- become familiar with the effects of radiation damage in CCDs and help shape the test programme that quantifies these effects on the dark energy parameters;
- design the scientific tests that will prove the correct functionality of the instrument and assist in the scientific aspects of the verification;
- specify (and if necessary generate) data required to support verification;
- review and write documentation for Euclid development;
- liaise with UK and international Euclid science teams;
- interface with the Euclid payload system teams;
- contribute to reports and presentations on MSSL Euclid activities at team and consortium meetings;
- pursue a research programme in the structure and evolution of our Galaxy, other galaxies and related fields.

Special working conditions

The post-holder will be required to travel to various European Euclid consortium institutes to represent MSSL at consortium meetings and to visit and to support and attend other scientific meetings or workshops as requested by the MSSL Euclid PI, Prof Cropper. The post holder may from time-to-time be required to work out of hours.
Contacts
The post holder will be required to interact frequently and effectively with other local and international team members.

Other conditions
The post holder will be required to actively follow UCL policies including ‘Equal Opportunities’, attend staff meetings and training as required, maintain an awareness of Fire and Health & Safety Regulations, carry out any other duties as are within the scope, spirit and purpose of the job, the title of the job and the grading as requested by the line manager or Head of Department. This job description reflects the present requirements of the post. As duties and responsibilities change and develop, the job description will be reviewed and be subject to amendment in consultation with the post-holder.
PERSON SPECIFICATION

Knowledge

Essential: Scientific expertise in a branch of observational astrophysics, space science or instrumentation.
Desirable: Familiarity with issues related to space-based instrumentation, such as calibration.

Qualifications

Essential: PhD astronomy, space science or instrumentation

Skills

Essential: Good written and oral communication skills (working language is English).
Essential: Working knowledge of one or more of the following: IDL, Java, Perl, C, Fortran 77/90/95, shell scripts, object-oriented concepts.

Aptitude

Essential: Good interpersonal abilities and proven capability to work collaboratively.
Essential: Proven record of ability to manage time and work to strict deadlines.

Previous experience

Essential: Research in astrophysics, space science or instrumentation.
Desirable: Experience of data simulation and/or CCD detectors.
Desirable: Experience of working collaboratively within a project (ideally space-based projects).
Desirable: Experience analysing data from space-based observatories.
Desirable: Experience of working on international projects and/or with international agencies.

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Further information:

Informal enquiries may be made to Prof Mark Cropper (msc@mssl.ucl.ac.uk).

Please apply online for this post at:

http://www.ucl.ac.uk/hr/vacancies/adverts/job-list.html

using reference number 1150503

If there are any difficulties please contact Libby Daghorn (ead@mssl.ucl.ac.uk) at MSSL, University College London, Holmbury St Mary, Dorking, Surrey RH5 6NT, UK, tel: 01483 204100