Job Related Information

This document includes information about the role for which you are applying and the information you will need to provide with your application.

1. Role Details

<table>
<thead>
<tr>
<th>Vacancy reference</th>
<th>14883</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title:</td>
<td>EUCLID Detector Simulation Scientist</td>
</tr>
<tr>
<td>Reports to:</td>
<td>Research Fellow in Space Sciences</td>
</tr>
<tr>
<td>Salary:</td>
<td>£33,199 to £39,609</td>
</tr>
<tr>
<td>Terms and conditions:</td>
<td>Academic Related</td>
</tr>
<tr>
<td>Grade</td>
<td>GR7</td>
</tr>
<tr>
<td>Duration of post:</td>
<td>Temporary contract until 31 March 2021</td>
</tr>
<tr>
<td>Working hours:</td>
<td>Full Time</td>
</tr>
<tr>
<td>Location:</td>
<td>Milton Keynes</td>
</tr>
<tr>
<td>Closing date:</td>
<td>Noon on 5 October 2018</td>
</tr>
<tr>
<td>Type of application form accepted:</td>
<td>Short</td>
</tr>
<tr>
<td>Number of referees required:</td>
<td>Three</td>
</tr>
<tr>
<td>Unit recruitment contact:</td>
<td>Fiona McGavin</td>
</tr>
</tbody>
</table>
2. Summary of duties

The Centre for Electronic Imaging (CEI) is a research centre within the School of Physical Sciences at the Open University. The CEI is a collaboration between the Open University and Teledyne e2v, a world-leading manufacturer of scientific and industrial image sensors. The CEI is dedicated to conducting research into advanced imaging technologies for science applications, with a particular focus on space applications, and provides knowledge exchange between UK industry and academia.

The CEI conducts its research in collaboration with many universities, space agencies and companies including the UK Space Agency, European Space Agency, NASA and Teledyne e2v. One such mission is ESA’s Euclid mission, which when launched will map the geometry of the dark Universe. The CEI is part of the Euclid VIS consortium and is responsible for the testing and modelling the performance of the sensor used in the Euclid VIS instrument.

This post at the CEI is work on the Euclid VIS CCDs as part of a small team. The job holder will be engaged in all aspects of the electro-optical and radiation characterisation and optimisation of the new CCD sensor including simulating its operation performance. The job holder will also act as the interface between the engineering studies of the sensor at the CEI and the astronomical measurements and accuracies required by the weak gravitational lensing measurements of Euclid VIS through our international collaborators. The work will involve evaluating the performance of the devices subjected to radiation damage effects and modelling the radiation effects. Experience of writing bespoke code and using publicly available software packages such as Python, MATLAB and GEANT 4 would be an advantage. The implications of these results on the weak gravitational lensing measurements to be made by the mission will then be explored in collaboration with our international partners such as the European Space Agency (ESA), Mullard Space Science Laboratory (MSSL) and Durham University (DU). The job holder will also attend regular project meetings and conferences, deliver progress reports and interface with team members and external scientists and engineers.

Ultimately, the role holder is expected to become a key expert in the development, operation and performance and modelling of the Euclid VIS CCDs, and analysis of the data from the instrument detectors.

Main Duties

The successful candidate will be expected to:

1. Analyse the results of the Euclid VIS CCD electro-optical test, characterisation and radiation campaigns and provide insights to those results based on the project requirements
2. Investigate and recommend the optimal Euclid VIS CCD operational parameters to ensure the best performance from the CCD during the Euclid mission lifetime
3. Analyse the results of the Euclid VIS CCD radiation damage studies to develop radiation correction algorithms for the Euclid VIS data processing pipeline
4. Simulate charge transfer through a radiation damaged detector, using inputs from the experimental work in the laboratory to refine the model. This work will involve collaboration with other partners (e.g. ESA, Durham University, Leiden University)
5. Build a full picture of the detector performance with the view of becoming a key detector expert for the Euclid VIS collaboration
6. Provide experimental test data to the Euclid VIS CCD working group
7. Professionally document the output of the work and role activities. Contribute to the CEI Euclid project documentation and data deliverables to the Euclid VIS Consortium and Euclid VIS CCD Working Group and beyond
8. Work closely with the CEI Euclid Project Team to ensure the progress of work adheres to any programmatic timescales. Report problems and non-compliances to the Project Team
9. Attend regular Project meetings, workshops and conferences. Report progress verbally and in written form and be an active member of the academic team
10. Support external collaborators (e.g. MSSL, DU, ESA) as directed by the Project Lead
11. Promote knowledge and technology exchange with Teledyne e2v and other project collaborators.

Other Duties

All Faculty staff are expected to:

- Comply with the University’s Health and Safety, Equal Opportunities and Computing policies in the performance of their duties;
- Take reasonable care of the Health and Safety of themselves and that of any other person who may be affected by their acts or omissions at work;
12. **Person specification**

**Requirements (E = Essential/ D = Desirable)**

**Education, qualifications and training**

- **Essential** - A PhD in Physics, Astronomy, Engineering or a closely related subject;

**Knowledge, work and other relevant experience**

**Essential:**
- Good understanding and experience in the characterisation of image sensors, data processing software;
- Good understanding and experience in writing data analysis software algorithms;
- Demonstrable proficiency in software algorithm development in MATLAB™, C/C++, Java and/or Python (or similar) development environments;

**Desirable:**
- Experience with CCD and/or CMOS imaging sensors; operation, test and calibration;
- Experience with X-ray and optical testing of imaging sensors;
- Knowledge or some experience in Astronomy/Space Science or applications of high performance imaging sensors;
- Electronics experience in fields related to CCD and CMOS imagers, including analogue and digital practice, plus data acquisition;
- Experience in the formation of simulation software to model physical effects and form predictive models to extrapolate performance;
- Experience of using SPENVIS, GEANT4 or similar software for radiation modelling.

**Personal abilities and qualities**

**Essential:**
- Good problem solving and analytical skills, demonstrated logical and rigorous approach to work;
- Demonstrated ability to work both as part of a team and on own initiative;
- Well-developed self-management skills with the ability to prioritise work appropriately, deal with several competing demands, manage own time effectively and deliver results to an agreed schedule;
- Excellent verbal and written communication in a team environment and good presentation skills. Ability to communicate effectively with colleagues from a wide range of backgrounds;
- Excellent work ethics.

**Desirable:**

13. **Role specific requirements e.g. Shift working**
5. About the unit/department

Faculty of Science, Technology, Engineering & Mathematics
The Faculty of Science, Technology, Engineering and Mathematics (STEM) is comprised:

- School of Computing & Communications
- School of Environment, Earth & Ecosystem Sciences
- School of Engineering & Innovation
- School of Life, Health & Chemical Sciences
- School of Mathematics & Statistics
- School of Physical Sciences
- Knowledge Media Institute
- Deanery including teams supporting Curriculum, Research and Enterprise, Laboratory Infrastructure and Faculty Administration

“We aspire to be world leaders in inclusive, innovative and high impact STEM teaching and research, equipping learners, employers and society with the capabilities to meet tomorrow’s challenges”

The Faculty of STEM consists of 700 staff and 1,800 Associate Lecturers. The Faculty delivers over 185 modules across undergraduate and postgraduate curriculum, supporting nearly 19,000 students (full time equivalents) which is 29% of the OU total.

The Faculty generates more research income (circa £17M) than any other Faculty in the University, supported by a comprehensive laboratory infrastructure.

We are proud of our distinctive values and capabilities underpinning our aspiration:

We are inclusive:
- We transform people’s lives, ensuring STEM education is openly accessible to many thousands of students from diverse backgrounds – our students express high satisfaction with their study experience
- We engage the public in exciting citizen science and engineering, including through free open educational resources, multi-platform broadcasting, outreach to inspire the next generation and with programmes to encourage more women into STEM

We are highly innovative:
- We are at the forefront of innovative developments in teaching practical science and engineering at a distance, through simulated and remote access laboratories and practical experimentation
- Our high quality teaching and curriculum are informed by world-leading research, strong links with professional bodies and communities of practitioners, as well as by scholarship focused on continuously improving our STEM pedagogy

We deliver significant social and economic impact:
- We provide STEM higher education at a scale and reach unsurpassed in the UK, with a sizeable international reach and further growth potential
- We inject transferable STEM skills and knowledge direct into the workplace for immediate employee and employer benefit, as students combine study while working
- The employability value of our courses is underpinned by accreditation from leading STEM Professional Bodies and Learned Societies, as well as partnerships and sponsorship with leading employers
- Our high quality, applied and academically relevant teaching and research addresses real-world issues, delivering impact for industry and society, including addressing pressing STEM skill-shortages across the UK
School of Physical Sciences

The School of Physical Sciences is a lively and innovative community of approximately 85 academic and research staff and 70 PhD students, mostly based in Milton Keynes. Our curriculum is supported by associate lecturer staff based all over the UK and Ireland whilst each year our physics, astronomy and planetary sciences and interdisciplinary science modules are studied by thousands of students all over the world.

Our research covers a wide range of subjects, broadly aligned with the research disciplines of

- Astronomy
- Physics
- Planetary and Space Sciences
- Space Instrumentation
- Physics Education

We have an extensive suite of world class facilities and laboratories, including advanced analytical instrumentation, experimental and simulation chambers and instrument development laboratories, complemented by regular use of large-scale facilities such as synchrotrons (e.g. Diamond) and a wide array of ground based and space-based telescopes (e.g. VLT, Hubble) as well as our own robotic telescopes in Tenerife. We play a major role in many well-known space missions such as Rosetta and ExoMars. We also apply much of our spaceflight and laboratory expertise to a wide array of real world problems including medical and environmental applications.

School members also contribute to the Open University’s teaching on a large range of modules and we have been at the forefront of many innovations in distance education, including the OpenScience Lab and the OpenScience Observatories. We are members of SEPnet, the South East Physics Network. Our commitment to equality and diversity has been recognised by the award of “Juno Champion” status by the Institute of Physics and an Athena SWAN Silver Award.

We currently offer undergraduate qualifications in Natural Sciences (with a physics route and an astronomy and planetary science route), with a strand which carries Institute of Physics accreditation, and in Mathematics and Physics. We also offer an MSc in Space Science and Technology. We are in the process of refreshing the curriculum at Stage 3, and are drawing up plans for adding an integrated MPhys to our portfolio, including topics in physics, astronomy, planetary and space science.

Priority Research Areas in the School of Physical Sciences

Astronomy

- The Compositional Universe: exploiting the spectroscopic discovery space from major facilities and projects including ALMA, JWST, SPICA, SOFIA and IRAM/NOEMA, E-ELT, VLT, SKA, JCMT, SALT, LOFAR, ELIPS, Herschel, SDSS-IV, Euclid etc., to study galactic star formation, evaporating exoplanets, and the physics of galaxies in the distant universe. We will further develop our laboratory/observational astrochemistry research to focus on the development of molecular compositional diagnostics.

- The Time-Domain Universe: exploiting the discovery space of new and future telescopes e.g. Gaia, LIGO, PLATO 2.0, TWINKLE, VLT and LSST, in studies such as galactic and extragalactic stellar populations using leading follow-up facilities such as SALT, or (as part of a wider follow-up network) our robotic telescopes, with a focus on key processes such as stellar binarity.

Physics

- Biomedical physics: to understand physical phenomena involved in conditions such as cancer and cardiovascular diseases and their treatment through experimental and theoretical investigations of a range of approaches such as electron-driven processes in radiation treatment and imaging, use of nanoparticles for cancer therapy and plasma sources for biomedical purposes.
• Quantum correlated systems: theoretical and experimental study of quantum correlations in atomic, molecular and condensed matter systems, and the development of practical applications such as quantum enhanced devices and the functionalisation of materials, as well as the development of multi-purpose software to treat electronic continua.

• Engineering physics: applied plasma research aimed at developing novel functional materials, understanding electron induced processes in nanofabrication and the development of plasma-driven techniques for advanced materials applications.

Planetary and Space Science

• Application of advanced analytical techniques, laboratory simulation, remote observation and modelling to investigate the key processes involved in the formation and evolution of the Solar System and the planetary bodies it contains, including the search for habitable environments and the presence of life.

• Maintain and build high scientific credibility for our analytical expertise by exploiting the performance of existing instruments and updating the analytical infrastructure in order to ensure leading involvement in upcoming sample-return missions, and maintain access to the most important planetary samples. Particular strengths are in the measurement of light-stable isotopes using conventional mass spectrometry and in-situ analysis of samples.

• Development and expansion of our expertise in planetary environments using modelling, remote sensing and the use of field analogues and simulation facilities on Earth, and secure further leading science team involvements in future planetary space missions.

Space Instrumentation

• Development of imaging sensors and instruments for space applications, with expertise in a range of wavelengths from IR to X-ray and the study of the effects of radiation damage, in order to secure involvement in future space missions.

• Development of miniaturized analytical instrument systems for planetary exploration missions, particularly for the measurement of volatiles, organic materials and their light stable isotope composition, and securing leading involvement in future planetary exploration missions.

• Knowledge exchange between the UK technology industry and academia, utilising the technologies and expertise in detectors and mass spectrometer systems to provide commercial products and solutions.

Physics Education Research

• Remote and virtual experimentation

• Concept inventories

• Interactive online assessment

• Demographic differences in achievement

6. How to obtain more information about the role or application process

If you would like to discuss the particulars of this role before making an application please contact Jesper Skottfelt on +44 (0) 1908 652698 or email: jesper.skottfelt@open.ac.uk.

If you have any questions regarding the application process please contact Fiona McGavin on +44 (0) 1908 858110 or email: STEM-Recruitment@open.ac.uk.
7. The application process and where to send completed applications

<table>
<thead>
<tr>
<th>Your application should contain:</th>
<th>Your application should contain:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Completed short application form;</td>
</tr>
<tr>
<td></td>
<td>• CV</td>
</tr>
<tr>
<td></td>
<td>• Covering letter detailing how you meet the person specification.</td>
</tr>
</tbody>
</table>

Please ensure that your application reaches the University by: Noon on 5 October 2018

E-mail your application to: STEM-Recruitment@open.ac.uk

Or post it to Name/Job title: Fiona McGavin, Staffing Adviser

Department/Unit: Deanery, Faculty of Science, Technology, Engineering & Mathematics

Address: The Open University, Walton Hall, Milton Keynes, MK7 6AA

8. Selection process and date of interview

<table>
<thead>
<tr>
<th>The interview panel will be chaired by:</th>
<th>Professor Andrew Holland, Professor of Electro-Optics and Director of the Centre of Electronic Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>The other members of the interview panel will be:</td>
<td>Dr Jesper Skottfelt, Research Fellow in Space Sciences</td>
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<tr>
<td></td>
<td>Plus others to be confirmed</td>
</tr>
<tr>
<td>The interviews will take place on:</td>
<td>To be confirmed</td>
</tr>
<tr>
<td>The selection process for this post will include:</td>
<td>To be confirmed</td>
</tr>
</tbody>
</table>

We will let you know as soon as possible after the closing date whether you have been shortlisted for interview. Further details on the selection process will also be sent to shortlisted candidates.

Applications received after the closing date will not be accepted.