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>13719</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title:</td>
<td>Project Officer (Image Sensor Scientist)</td>
</tr>
<tr>
<td>Reports to:</td>
<td>Professor of Electro-Optics</td>
</tr>
<tr>
<td>Salary:</td>
<td>£32,004 to £38,183</td>
</tr>
<tr>
<td>Terms and conditions:</td>
<td>Academic Related</td>
</tr>
<tr>
<td>Grade</td>
<td>G7</td>
</tr>
<tr>
<td>Duration of post:</td>
<td>Temporary for 24 months</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, 31 August 2017</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>
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</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 and provides knowledge exchange between UK industry and academia.

The CEI conducts its research in collaboration with many universities, agencies and companies including the UK Space Agency, European Space Agency, NASA and Teledyne e2v. One such mission is JUICE (JUpiter ICy moons Explorer http://sci.esa.int/juice/), a major forthcoming space mission by the European Space Agency to study Jupiter and its moons Ganymede, Europa and Callisto. One of the instruments onboard JUICE is JANUS, a high resolution camera operating in the visible band. The UK Space Agency (UKSA) has approved funding for the CEI to lead the UK effort for the characterisation of a new CMOS image sensor and supply fully qualified devices to the JANUS consortium. The sensor, named CIS115, has been designed and manufactured by Teledyne e2v. This type of CMOS image sensor has no flight heritage and requires detailed characterisation to obtain high levels of confidence that it will perform well in the challenging radiation environment in the Jovian system.

The post holder will work at the CEI on the sensor for JANUS as part of a small team. The role holder will be engaged in all aspects of the electro-optical and radiation characterisation of the new CMOS sensor, and is expected to become a key expert in its operation and performance. The work will involve detailed electro-optical characterisation of non-irradiated sensors, performing high energy sensor irradiation similar to the expected environment around Jupiter and evaluating the performance of the devices subjected to radiation damage effects. Modelling radiation effects will also be undertaken, and experience of using Geant 4 would be an advantage. The role holder will also attend regular project meetings and conferences, deliver progress reports and interface with team members and external scientists.

Main Duties
The successful candidate will be expected to:

1. Adapt the experimental set-up for laboratory testing of CIS115 image sensors for electro-optical testing. Establish reliable and repeatable performance under cooling for testing with light and X-rays.
2. Carry out complete electro-optical characterisation of several CIS115 sensors (both engineering models and flight models), including responsivity, noise, dark current, quantum efficiency, full well capacity, dynamic range, linearity, modulation transfer function and image lag.
3. Perform further proton, electron or gamma irradiations of CIS115 devices in order to simulate the conditions in-orbit in the Jupiter system and performance degradation during the science mission.
4. Carry out electro-optical characterisation of irradiated CIS115 sensors and evaluate the change of performance. Propose and implement techniques to mitigate the effects from radiation damage.
5. Build a full picture of the detector performance with the view of becoming a key detector expert for the JANUS collaboration. Propose and implement techniques or device operational parameters to optimise performance.
6. Dissemination of the results of the research as the work progresses through presentations and papers at scientific meetings and conferences and through regular papers in journals. Attend regular project meetings and conferences. Report progress verbally and in written form.
7. Work closely with the CEI JUICE Project Team to ensure the progress of work adheres to any programmatic timescales. Report problems and non-compliances to the Project Team.
8. Contribute additional material and inputs as required for publications by the academic team.
9. Promote knowledge and technology exchange with Teledyne e2v.

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.
3. Person specification

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

**Education, qualifications and training**

- A BSc in Physics, Electronic Engineering or a closely related subject

**Knowledge, work and other relevant experience**

**Essential:**
- Good understanding and experience in the characterisation of image sensors, proficiency with data acquisition systems and data processing software, experience with vacuum and cryogenic equipment

**Desirable:**
- Electro-optical characterisation of CMOS image sensors, knowledge or radiation damage effects in semiconductors, knowledge of electronics
- Understanding of electronic circuits, optics and imaging
- Experience of using Geant 4 for simulations
- Experience of using Spenvis (or similar) 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
- Strong 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:**

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

Faculty of Science, Technology, Engineering & Mathematics
The newly formed Faculty of Science, Technology, Engineering and Mathematics (STEM) comprises:

- 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 more than 20,000 students (full time equivalents) which is 29% of the OU total.

The Faculty generates more research income (circa £20M) 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 80 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; physics, astronomy and planetary sciences undergraduate modules are currently being studied by hundreds of students all over the world and we also contribute to an introductory and interdisciplinary science modules being studied by several thousand students.

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 unparalleled suite of analytical instrumentation in our modern laboratories on campus; this is complemented by our regular use of multi-national facilities such as the Diamond synchrotron and ESO’s telescopes. We have contributed to well-known space missions such as the Rosetta Mission, and have developed some of our spaceflight instrumentation for 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. 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 Mathematics and Physics and Natural Sciences (with a physics pathway and an astronomy and planetary science pathway), with a strand which carries Institute of Physics accreditation. We are in the process of refreshing the curriculum, both at entry level to reflect the diverse range of entry qualifications of our students, and at Stage 3. In the near future we are likely to offer a BSc (Hons) Physics and/or a BSc (Hons) Astronomy and Planetary Science and/or an integrated MPhys, including physics, astronomy, planetary and Space science. A new MSc in Space Science and Technology is currently recruiting students and will run for the first time from February 2017.

**Priority Research Areas in the School of Physical Sciences**

**Astronomy**

- The Compositional Universe: exploiting the spectroscopic discovery space from ALMA, JWST, SPICA, SOFIA and IRAM/NOEMA, E-ELT, VLT, SKA, JCMT, SALT, LOFAR, ELIPS, Herschel, SDSS-IV, Euclid strong lensing, 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 Ross Burgon on +44 (0) 1908 659602 or email: ross.burgon@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, 31 August 2017

E-mail your application to: STEM-Recruitment@open.ac.uk
8. Selection process and date of interview

<table>
<thead>
<tr>
<th>The interview panel will be chaired by:</th>
<th>Professor Andrew Holland</th>
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<tbody>
<tr>
<td>The other members of the interview panel will be:</td>
<td>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.