**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>13981</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title:</td>
<td>Post Doctoral Research Associate x 2</td>
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<tr>
<td>Reports to:</td>
<td>Professor of Electro-Optics</td>
</tr>
<tr>
<td>Salary:</td>
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<tr>
<td>Terms and conditions:</td>
<td>Research</td>
</tr>
<tr>
<td>Grade</td>
<td>AC1/2</td>
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<tr>
<td>Duration of post:</td>
<td>Temporary contract for 36 months</td>
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<tr>
<td>Working hours:</td>
<td>Full Time</td>
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<tr>
<td>Location:</td>
<td>Milton Keynes</td>
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<tr>
<td>Closing date:</td>
<td>Noon on 24 October 2017</td>
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<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 and training 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, and plays a crucial role in many international space mission instrument teams such as Euclid VIS, SMILE SXI, ATHENA WFI, JUICE JANUS and WFIRST-CGI. This research focusses on advanced imaging technologies under three main themes:

- CCD and CMOS design and technology development
- Fundamental CCD and CMOS detector physics and radiation damage
- Space and ground-based applications and instrument development including astronomy, planetary science, solar and terrestrial physics, Earth observation, synchrotron science and technology translation applications

The CEI also supports training through many initiatives including a post-graduate PhD research programme, continual professional development (CPD) through CCD, CMOS and radiation damage workshops and development of teaching materials supporting the OU curriculum.

The CEI is also part of a larger space group within the Open University that includes other space instrument development teams (Beagle2 GAP, Rosetta Ptolemy, ExoMars TGO NOMAD, Luna 27 ProsPA), extra-terrestrial in-situ resource utilisation (ISRU) and habitats and the exploitation of space data. The CEI’s research also complements other space-related research undertaken within the School of Physical Sciences and the Faculty of Science, Technology, Engineering and Mathematics.

The CEI Research Associate will join a 20-strong team of scientists and engineers to support the research goals of the CEI, to work on existing and new research projects within the themes described above (commensurate with role holder background experience) and to promote knowledge exchange with industrial partner Teledyne e2v. The role holder will also attend regular research meetings and conferences, produce peer-review publications, mentor and supervise PhD students, deliver training workshops and support more generally the goals of the CEI.

Main Duties

Depending on the background experience of the candidate the successful candidate will be expected to perform one or more of the following:

1. Suitable to addressing the research question(s) under investigation:
   - Develop, set-up, commission and operate CCD and CMOS electro-optical test camera systems, including the development of data acquisition algorithms
   - Develop, plan and execute electro-optical test, characterisation and radiation campaigns
   - Develop data analysis algorithms and analyse the results of those campaigns.
2. Design, simulation and layout of CMOS of CMOS image sensor devices. Development of PCB hardware and software to support sensor characterisation and execution of laboratory characterisation campaigns.
3. Simulation of CCD and CMOS device operation and charge transfer using 3D semiconductor modelling tools with an emphasis on investigating application-specific optimisations of device architecture.
4. Radiation modelling using publicly available tools such as GEANT4, SPENVIS etc. and the development of new radiation transport models for applications in CEI research projects.

All candidates will be expected to:

5. Provide experimental test data and reports to CEI project teams and other researchers within the group.
6. Professionally document and record role activities, outcomes and results and contribute to the CEI documentation and data repositories.
7. Author and contribute to peer-review publications and internal technical notes.
8. Attend and contribute to internal, national and international conferences, seminars and workshops. Report progress verbally and in written form.
9. Work closely with the CEI (project) management team(s) to ensure the progress of research adheres to any programmatic timescales. Report problems and non-compliances.

10. Undertake professional development as an academic researcher.

11. Promote knowledge and technology exchange with Teledyne e2v and other CEI, SPS and STEM 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.
- Cooperate with the University in ensuring as far as is necessary, Statutory Requirements, Codes of Practice, University and Faculty policies are complied with.
- Have a strong commitment to the principles and practice of equality and diversity.
- Attend appropriate staff development events.

1. Person specification

Requirements  (E = Essential/ D = Desirable)

Education, qualifications and training

- A PhD in Physics, Electronic Engineering or a closely related subject
- Demonstrable proficiency matching one or more of the Main Duties detailed above

Knowledge, work and other relevant experience

Essential:
- Demonstrable proficiency in software algorithm development in MATLAB™, C/C++, Java and/or Python (or similar) development environments
- A good understanding of semiconductor physics, electronics and MOS circuits

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
- CMOS image sensor design experience, mixed signal IC design, optoelectronics, PCB layout
- Experience in the formation of simulation software to model physical effects and form predictive models to extrapolate performance

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
2. 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 SEPPnet, 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 Professor Andrew Holland on +44 (0) 1908 332945 or email: andrew.holland@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

| Your application should contain: | • Completed short application form;  
| | • CV  
| | • Covering letter detailing how you meet the person specification. |

| Please ensure that your application reaches the University by: | Noon on 24 October 2017 |

| 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

| The interview panel will be chaired by: | Professor Andrew Holland |

| The other members of the interview panel will be: | To be confirmed |

| The interviews will take place on: | To be confirmed |

| The selection process for this post will include | To be confirmed. |

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.