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>14227</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title:</td>
<td>IC Designer – Scientific Image Sensors</td>
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<tr>
<td>Reports to:</td>
<td>Professor of Electro-Optics</td>
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<tr>
<td>Salary:</td>
<td>£32,548 - £38,833</td>
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<tr>
<td>Terms and conditions:</td>
<td>Academic Related</td>
</tr>
<tr>
<td>Grade</td>
<td>7</td>
</tr>
<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 29 January 2018</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>3</td>
</tr>
<tr>
<td>Unit recruitment contact:</td>
<td>Fiona McGavin</td>
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</table>
2. Summary of duties

The Centre for Electronics 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 is growing its activities in the area of CMOS image sensors research, following previous work funded by the Regional Growth Fund (RGF) and the UK space agency (UKSA). This post is intended to increase our capabilities in CMOS image sensor design and characterisation.

Presently the CEI is working on novel silicon CMOS image sensors for space, astronomy and X-ray detection applications. For X-ray and near-infrared detection the sensors require thick, fully depleted sensitive volume to ensure good quantum efficiency in addition to low readout noise. Achieving this requires custom manufacturing, layout and biasing techniques, and forms an important part of the CMOS image sensor research at the CEI. Electron multiplication (EM) and Time Delay Integration (TDI) imaging with CMOS sensors is another area of research which could offer advantages over established CCD technology. Both areas are underpinned by our abilities to perform sophisticated semiconductor device simulations using TCAD tools.

The CEI is looking to expand its expertise into the two research areas and develop new devices and IP in scientific CMOS imaging.

The post holder will be engaged in all aspects of the design, modelling, simulation and layout of new CMOS image sensors, their characterisation, interfacing with team members, external engineers and semiconductor foundries, maintaining the design toolkits and dissemination of the results of the research. The role requires a high level of creativity and innovation.

Main Duties

1. Design, simulation and layout of CMOS image sensor using Cadence tools.
2. TCAD semiconductor device simulations of image sensors at pixel level.
3. Perform laboratory characterisation of the CMOS image sensors.
4. Specify and develop PCB hardware and software to support sensor characterisation.
5. Integrate design toolkits and ensure correct operation of the Cadence Virtuoso IC design software. Liaise with the SPS computer administrator to maintain the software.
6. Create and maintain technical documentation relating to sensor design.
7. Ensure outcomes are appropriately reported and disseminated as the work progresses including the writing of content for research publications and presenting at conferences and workshops internally and externally.
8. Work with the Professor of Electro-Optics and Senior Research Fellow in the writing of project proposals and funding applications, providing advice on issues relating to image sensor design.
9. Promote knowledge and technology exchange with Teledyne e2v.

All staff are expected:
- to undertake any other duties which may reasonably be required
- to take reasonable care of the Health and Safety of themselves and that of any other person who may be affected by your acts or omissions at work.
- to demonstrate a strong commitment to the principles and practice of equality and diversity.

3. Person specification
### Requirements  *(E = Essential/ D = Desirable)*

#### Education, qualifications and training

BSc or equivalent qualification in electronic engineering or a related subject

#### Knowledge, work and other relevant experience

**Essential:**
- An excellent understanding of semiconductor physics, electronics and MOS circuits, hands-on design and layout of analogue and digital CMOS circuits, proficiency with Cadence Virtuoso/Spectre design tools
- Experience of project management including knowledge of intellectual property

**Desirable:**
- MSc or PhD in electronic engineering or a related subject
- CMOS image sensor design, mixed signal IC design, TCAD semiconductor device simulations, optoelectronics, PCB layout, software development for data acquisition systems.

#### Personal abilities and qualities

**Essential:**
- Excellent problem solving and analytical skills
- Demonstrable ability to work as part of a team and on own initiative
- Strong verbal and written communication skills
- Able to present to a wide range of audiences
- Excellent work ethics

**Desirable:**

#### 4. 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 Physical Sciences. 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, SAL, 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 multipurpose 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 Konstantin Stefanov on +44 (0) 1908 332116 or email: Konstantin.stefanov@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
- A covering letter detailing how you meet the person specification
Please ensure that your application reaches the University by:  
Noon on 29 January 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</th>
</tr>
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</table>
| The other members of the interview panel will be: | Konstantin Stefanov  
The other panel members are to be confirmed |
| The interviews will take place on: | TBC |
| The selection process for this post will include | A formal technical interview |

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.