Job Description – Job Title: Senior Spaceflight Project Officer

About the role

The Open University’s School of Physical Sciences (SPS) is a world-leader in the development of laboratory instrumentation for solar system sample analysis and environmental simulation. In the very active area of Mars exploration, members of SPS continue to play a leading role in many activities, including a leading role in the NOMAD spectrometer instrument and an operations lead for the CaSSIS stereo camera that are onboard the ExoMars Trace Gas Orbiter mission which is currently in its primary science phase around Mars. This work is supported by funding from UK Space Agency (UKSA) and forms the platform for several major research programs funded by the European Space Agency (ESA) and UKSA for a number of staff within SPS. This post relates to the technical oversight, implementation and management of these space-related research activities led by Dr. Manish Patel.

Key responsibilities

The post holder will work as part of a team, and sometimes on their own initiative, to design, develop and implement contract research activities and spaceflight instrumentation development work using new and existing equipment/theoretical models to meet the requirements of the research applications.

Main Duties

- To ensure the efficient running of, and undertake operational control of, spaceflight and space agency projects including the NOMAD spectrometer, the CaSSIS imager, the BEERS space socioeconomics study and grants/projects relating to these activities.
- To identify and assess practical problems within the projects and ensure that all personnel receive appropriate training in the use of software and carry out project practices and procedures in accordance with good project practice.
- To be responsible for negotiating discounts and best prices for relevant consumables/equipment and tendering for necessary software and services.
- To ensure that spacecraft operations activities comply with current European Space Agency protocols, and be responsible for ensuring that all procedures are up to date and reviewed and that Fault Detection, Isolation and Recovery procedures are drafted and complied with. The role holder will liaise with European Space Agency science operations controllers and mission operations advisors and attend regular mission-level operations meetings.
- To disseminate information relating to all project matters and provide advice to the responsible lead on all matters relating to the function of the project with respect to the Faculty and the University as a whole.
- To lead and manage the in-house training of project staff (postgraduates, technical project officers) in research practices and techniques.
• To contribute expertise and scientific ideas to research projects, methodologies and teaching areas as appropriate.
• To administer the operational budget associated with the projects, covering hardware consumables and equipment, equipment service and repair to be administrated on a priority basis according to the strategic needs of the group and within budgetary restrictions.
• To be responsible for managing Project Officers supporting the NOMAD and CaSSIS instrument operations, and other instruments as required.
• To investigate and establish methods for new sources of external income wherever possible.
• To plan for operational control needs of potential future spaceflight projects, including liaising with OU estates team, IT infrastructure and other contractors when necessary in order to maintain the operational functionality of the project team.

Other Duties

All staff are expected to:
• co-operate with the Open University in ensuring as far as is necessary, that Statutory Requirements, Codes of Practice, University Policies and School Health and Safety arrangements are complied with.
• have a strong commitment to the principles and practice of equality and diversity.
  attend appropriate staff development events

Role Specific requirement

• The role will require travel to Europe, Russia and USA for meetings.
Skills and experience

Essential

- Educated to at least degree level in physical sciences, or other closely related discipline/equivalent experience

Knowledge, work and other relevant experience

Essential

- Significant experience of telecommand generation and operations procedures techniques for spaceflight instruments.
- Significant experience in acquisition, analysis and manipulation of large data sets from spaceflight instruments.
- Knowledge and practical experience of the operation and characterisation of CCD detectors.
- Experience of European Space Agency spaceflight operations protocols and medium term and short term planning.
- Practical IT experience in Microsoft Office
- Experience of Python, IDL and MATLAB numerical coding languages.

Desirable

- Excellent knowledge of use of SPICE kernels for orbit analysis.
- Experience of orbit visualisations using Cosmographia.
- Detailed knowledge of optical spectrometer operating principles.
- Knowledge of the operating principles of the NOMAD and CaSSIS instruments on ExoMars Trace Gas Orbiter.
- Experience in PDS (or equivalent) data archiving.
- Experience in coordinating spaceflight-related technical activities within a team.

Personal abilities and qualities

Essential

- Experience in leading teams
- Experience of working in a higher education establishment
- Demonstrated ability to plan and prioritize own workload and delivery in a timely manner
- Demonstrated ability to solve problems and come up with new ideas
- Good oral and written communication skills
- Good negotiating and influencing skills

Desirable

- Demonstrated ability to successfully line manage support staff
About the Unit

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 90 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 introductory and interdisciplinary science modules which are studied by several thousand students each year.

School members 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 award winning OpenSTEM Labs that feature the OpenScience Laboratory and the OpenScience Observatories. 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 an astronomy and planetary science pathway. We are in the process of refreshing the curriculum, both at intermediate level and at Stage 3. We expect to offer a BSc in Physics in the near future and aspire to offer an integrated MPhys, including physics, astronomy, planetary and Space science. At postgraduate level we offer an MSc in Space Science and Technology.

Our research covers a wide range of subjects, broadly aligned with the research disciplines of:
• Astronomy
• Physics
• Planetary and Space Sciences
Our extensive planetary science laboratory facilities are broadly sub-divided into those used to characterise the chemistry and isotopic composition of matter in the Solar System or the simulation of Earth and Planetary processes. Instruments include state-of-the-art commercially sourced (e.g. Nano-SIMS; FIB-SEM; laser Raman microprobe; stable isotope and noble gas mass spectrometers and GC-MS) as well as unique instruments developed in-house (e.g. ‘Finesse’ mass spectrometer; Mars atmosphere and surface simulation chambers; All-Angle Light Gas Gun). These are backed up by clean rooms and sample preparation facilities, instrument development laboratories and an extensive meteorite collection.

We have a long history of involvement in major Solar System exploration missions. We have been, and continue, to be involved in the analyses of samples returned by spacecraft (e.g. Stardust, Genesis, OSIRIS-REx) and have extensive experience in the acquisition and characterisation of new sample through the exploitation of instruments developed at the OU, such as on Cassini Huygens, Rosetta and Exomars Trace Gas Orbiter, and through international collaborative teams. PSS members are active in the development of new mission proposals and studies with ESA, other space agencies and national programmes.

Research activity in Planetary and Space Sciences is funded mostly by the UK Science & Technology Funding Council (STFC), the European Space Agency and European Union, but also draws in support from other research councils, charities and industry.

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

**Planetary and Space Science**

Solar System formation and evolution: Investigation of the key processes involved in the formation and chemical, physical and dynamical evolution of the Solar System and its constituent planets, satellites and minor bodies, through application of advanced analytical techniques, laboratory simulation, remote observation, in-situ measurements and modelling.

Planetary environments: Investigation of the geological and physical processes that shape planetary surfaces and atmospheres, including the search for habitable environments and the presence of life, using modelling, remote sensing and in-situ measurements, and the use of field analogues and simulation facilities on Earth.

Infrastructure and expertise: Exploitation of existing facilities and enhancement of our capabilities (e.g. in: the measurement of light-stable isotopes using conventional mass spectrometry; in-situ analysis of samples; hypervelocity impacts; Mars and cometary environment simulation) that are essential to ensure access to leading science team and instrument involvements in future planetary space missions, and returned planetary samples.

**Space Instrumentation**

Imaging detectors and instruments: development of imaging sensors and instruments for space applications, with expertise in a range of wavelengths from ultra-violet to X-ray and the study of the effects of radiation damage, in order to secure involvement in future space missions.
Analytical instruments: 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.

In-situ resource utilisation (ISRU) and space habitat research: initially targeted at future developments for the proposed Deep Space Gateway and Lunar (and Martian) exploration.

Knowledge exchange and translational research: development of further links between the UK technology industry and OU academics, utilising our expertise in detectors and mass spectrometer system technology and techniques from our space research to provide commercial products and solutions for terrestrial applications.

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.

Physics Education Research

Development of key areas where SPS staff have national or international leadership in Physics Education Research including remote and virtual experimentation, concept inventories, interactive online assessment, and demographic differences in achievement.