UNIVERSITY OF SUSSEX

1 Advertisement

Post Title: Post-Doctoral Research Fellow in Radiation Detection Instrumentation – Machine XRF

School/department: MPS / Physics and Astronomy
Hours: Full time or part time hours considered up to a maximum of 1.0 FTE. Requests for flexible working options will be considered (subject to business need).
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Contract: fixed term for 1 year, initially
Reference: 6330
Salary: £33,797 to £40,322 or £41,526 to £49,553 per annum, pro rata if part time
Placed on: 9 July 2021
Closing date: 9 August 2021. Applications must be received by midnight of the closing date.
Expected Interview date: TBD
Expected start date: ASAP

We are seeking a highly motivated, capable, and goal-orientated post-doctoral researcher at the Grade 7 or Grade 8 level to join the Space Research Group at University of Sussex. The successful candidate will play a major role in the development of novel high performance instrumentation for radiation detection in extreme environments. It is hoped that the successful candidate will become a long-term member of the research group.

The primary purpose of this role is to design and develop a photon counting semiconductor X-ray fluorescence spectrometer to be deployed in the real time condition monitoring of oil lubricated machines, particularly in the oil and gas sector. Beyond this, the successful appointee will be expected to contribute productively to the development of advanced radiation detection and measurement instrumentation for other applications, particularly in the space, nuclear, and defence sectors.

The successful appointee will be required to work productively with industrial and governmental partners in the oil, mineral, and mining, and defence and national security sectors.

The Space Research Group is based in the School of Mathematical and Physical Sciences. The research group conducts fundamental and applied research on topics of relevance to Space Science, Defence, National Security, Nuclear, Optoelectronics, and Semiconductor Physics and Engineering. As well as being focused on high quality academic outputs, the group is engaged in the economic development of its research for space and terrestrial purposes.

Please include a full CV and covering letter with your application.

Informal enquiries may be addressed to Prof. Anna M. Barnett by Email at anna.barnett@sussex.ac.uk.

The University is committed to equality and valuing diversity, and applications are particularly welcomed from women and black and minority ethnic candidates, who are under-represented in academic posts in Science, Technology, Engineering, Medicine and Mathematics (STEMM) at Sussex.

Please note that this position may be subject to ATAS clearance if you require visa sponsorship.

For full details and how to apply see our vacancies page

The University of Sussex values the diversity of its staff and students and we welcome applicants from all backgrounds.

2. The School / Division

Please find further information regarding the school/division at http://www.sussex.ac.uk/mps/

3. Job Description

Job Description for the post of: **Research Fellow I or II in Radiation Detection Instrumentation**

Department: Physics and Astronomy

Section/Unit/School: MPS

Location: University of Sussex, Falmer, Brighton

Grade: Grade 7 or Grade 8

Responsible to: Prof. Anna M. Barnett

Responsible for: N/A

Research Fellow I in Radiation Detection Instrumentation

Job Title:	Research Fellow in Radiation Detection Instrumentation
Grade:	Research Fellow I, Grade 7
School:	MPS
Location:	Falmer, Brighton
Responsible to:	Principal Investigator through to Head of School
Direct reports:	n/a

Key contacts:	Members of research group, members of faculty within the School and University.
Role description:	Research Fellow I is an early career-grade research position. Post-holders will be expected to contribute to the work of the research team, and also to develop their research skills with support from more experienced members of staff.

PRINCIPAL ACCOUNTABILITIES

1. To engage in individual and/or collaborative research activity resulting in high-quality publications; and to develop research funding and knowledge exchange income individually or in collaboration with others, as appropriate, depending on the size and scope of the bid.

2. To contribute to School teaching activities.

KEY RESPONSIBILITIES

1. Research, Scholarship & Enterprise

1.1 Develop research objectives and proposals for own or joint research, at acceptable levels, with assistance if required.

1.2 Conduct research projects individually and in collaboration with others.

1.3 Analyse and interpret research findings and draw conclusions on the outcomes.

1.4 Produce high-quality research outputs for publication in monographs or recognised high-quality journals, or performance/exhibition, as appropriate, and contribute to the School's REF submission at acceptable levels of volume and academic excellence.

1.5 Contribute to the preparation of proposals and applications to external bodies, for example for funding purposes.

1.6 Individually or with colleagues, explore opportunities for enterprise activity, knowledge exchange income and/or consultancy, where permissible.

1.7 Build internal contacts and participate in internal networks and relevant external networks in order to form relationships and collaborations.

1.8 Continually update knowledge and understanding in field or specialism, and engage in continuous professional development.

2. Teaching & Student Support

2.1 Undertake teaching duties, if required.

2.2 Assist in the assessment of student knowledge and supervision of student projects if required.

2.3 Assist in the development of student research skills, for example as part of a postgraduate supervision team.

3. Contribution to School & University

3.1 Attend and contribute to relevant School and project meetings.

3.2 Undertake additional duties, as required by the Principal Investigator and/or Head of School.

4. Role-specific duties

4.1 Design novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.2 Develop novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.3 Build novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.4 Characterise novel miniature X-ray fluorescence spectrometers (and components therefore) suitably for the intended application.

4.5 Deploy novel miniature X-ray fluorescence spectrometers (and components therefore) suitably for the intended application.

4.6 Analyse data from X-ray fluorescence spectrometers.

4.7 Provide day-to-day management of the experimental and theoretical research work (including data analysis) associated with the project.

4.8 Proactively and usefully contribute to the management of the Space Research Group and its activities.

4.9 Proactively and usefully contribute to the commercialisation of Space Research Group's research.

This Job Description sets out current duties of the post that may vary from time to time without changing the general character of the post or level of responsibility entailed.

INDICATIVE PERFORMANCE CRITERIA

- A PhD or equivalent scholarly or relevant professional activity
- Pursuing a line of independent research within a research group.
- Publishing research (either from a recently completed PhD or new original research).
- Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.

- Initiating, developing or participating in links between the University and external bodies such as business and industry, the professions, community organisations and policy-makers.

- Evidence of successful engagement in teaching or supervision.

4. Person Specification

ESSENTIAL CRITERIA

1. Normally educated to doctoral level, or other equivalent qualification, or appropriate level of experience, as appropriate to the discipline (see role-specific criteria below).

2. Evidence of engagement in high-quality research activity.

3. Excellent presentation skills, with the ability to communicate effectively, both orally and in writing, with students, colleagues, and external audiences.

4. Ability to work individually on own initiative and without close supervision, and as part of a team.

5. Ability to exercise a degree of innovation and creative problem-solving.

6. Excellent organisational and administrative skills.

7. Ability to prioritise and meet deadlines.

8. Excellent IT skills.

ESSENTIAL ROLE-SPECIFIC CRITERIA

1. Relevant experience of the design and development of radiation detection and measurement instrumentation

2. Relevant detailed understanding of semiconductor radiation detectors and their characterisation

3. A clear commitment to sustaining, growing, and achieving excellence in research and commercialisation activities.

4. A clear ability to operate successfully with minimal supervision.

5. World-leading experimental skills.

6. Demonstrated ability to write high quality reports and documents in English

DESIRABLE CRITERIA

1. Emerging track record of high-quality publications in reputable journals and other appropriate media of similar standing.

2. Experience of generating research or knowledge exchange income.

3. Relevant experience of the design and development of novel compound semiconductor X-ray spectrometers from scratch.

4. Relevant experience of developing X-ray fluorescence spectroscopy instrumentation.

5. Relevant experience of development of low-noise charge-sensitive preamplifiers for radiation detection.

6. Relevant experience of the characterisation of compound semiconductor spectroscopic photon counting X-ray detectors.

7. Relevant experience of the design and development of instrumentation and systems for space science, defence technology, nuclear applications, ocean exploration, oil and gas or mining, or other harsh environments.

8. Relevant mechanical and/or electronic workshop skills e.g. operation of milling machines, 3D printers, PCB production, electronic component soldering to high standards (e.g. to NASA workmanship standards).

9. Experience of day-to-day management of a physical science laboratory or workshop.

10. Experience of working with radiation sources or supervising work with radiation sources.

11. Experience of computer aided design

12. A clear commitment to sustaining, growing, and achieving excellence in research and commercialisation activities.

Research Fellow II in Radiation Detection Instrumentation

Job Title:	Research Fellow II in Radiation Detection Instrumentation
Grade:	Research Fellow II, Grade 8
School:	MPS
Location:	Falmer, Brighton
Responsible to:	Principal Investigator through to Head of School
Direct reports:	n/a
Key contacts:	Members of research group, members of faculty within the School and University, academics in the field in other institutions.
Role Description:	Research Fellow II is a career-grade research position. Post-holders will be expected to take a senior role within a research team, be able to demonstrate an established research portfolio, and a growing reputation in their field of study. They will also be expected to provide support and guidance to less experienced members of staff.

PRINCIPAL ACCOUNTABILITIES

1. To engage in individual and/or collaborative research activity resulting in high-quality publications; and to contribute to obtaining research funding and knowledge exchange income as appropriate.

2. To contribute to School teaching activities.

KEY RESPONSIBILITIES

1. Research, Scholarship & Enterprise

1.1 Contribute to the development of School research strategy and themes.

1.2 Develop research objectives and proposals for own or joint research at acceptable levels.

1.3 Conduct research projects individually and/or in collaboration with others.

1.4 Assess, interpret and evaluate outcomes of research, and develop ideas for their application.

1.5 Produce high-quality research outputs that have impact in the field, for publication in monographs or recognised high-quality journals, or performance/exhibition, as appropriate, and contribute to the School's REF submission at acceptable levels of volume and academic excellence.

1.6 Lead small research projects and/or identified parts of a larger project, including supervising the work of others and managing or monitoring a research budget.

1.7 Make presentations at conferences, or exhibit work in other appropriate events of a similar standing and identify ways to disseminate research outputs informally via the Internet, the media and other forms of public engagement.

1.8 Identify sources of funding and secure or contribute to the process of securing bids.

1.9 Identify and secure opportunities for enterprise activity, knowledge exchange income and/or consultancy where permissible.

1.10 Actively build internal and external contacts, and play a key role in internal networks and relevant external networks in order to, for example, identify sources of funding, secure student placements, and build relationships for future activities.

1.11 Contribute to a relevant national professional body or recognised events.

1.12 Continually update knowledge and understanding in field or specialism, and engage in continuous professional development.

1.13 Conduct risk assessments, and take responsibility for the health and safety of others, if required.

2. Teaching & Student Support

2.4 Contribute to teaching and learning in the School, including delivery of teaching if required.

2.5 Supervise postgraduate research students, for example as part of a postgraduate supervisory team.

2.6 Assist in the development of student research skills.

3. Contribution to School & University

3.3 Attend and contribute to relevant School and project meetings.

3.4 Mentor less experienced colleagues, supporting them in developing their research techniques, and advising on personal development.

3.5 Undertake additional duties, as required by the Principal Investigator and/or Head of School.

4. Role-specific duties

4.1 Design novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.2 Develop novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.3 Build novel miniature X-ray fluorescence spectrometers (and components therefore) from scratch suitable for the intended application.

4.4 Characterise novel miniature X-ray fluorescence spectrometers (and components therefore) suitably for the intended application.

4.5 Deploy novel miniature X-ray fluorescence spectrometers (and components therefore) suitably for the intended application.

4.6 Analyse data from X-ray fluorescence spectrometers.

4.7 Provide day-to-day management of the experimental and theoretical research work (including data analysis) associated with the project.

4.8 Proactively and usefully contribute to the management of the Space Research Group and its activities.

4.9 Proactively and usefully contribute to the commercialisation of Space Research Group's research.

This Job Description sets out current duties of the post that may vary from time to time without changing the general character of the post or level of responsibility entailed.

INDICATIVE PERFORMANCE CRITERIA

- Regular published output of original research at international level (referred journal papers, monographs, book chapters, text-books).
- Other evidence of original research contribution to the field, such as through invited conference contributions, membership of editorial panels etc.
- Evidence of successful co-supervision of doctoral students.
- Evidence of the successful supervision of others within the research group.
- Evidence of contribution to the process of obtaining competitive/peer reviewed research support funding or collaboration in significant research projects with institutions of equivalent standing.
- Involvement in the creation, transfer and use of the results of research through a range of knowledge exchange activities.
- Success in transferring research results to commercial, professional, public sector or other practical use.
- Evidence of successful engagement in teaching or supervision.

4. Person Specification

ESSENTIAL CRITERIA

1. Normally educated to doctoral level, or other equivalent qualification, or appropriate level of experience, as appropriate to the discipline (see role-specific criteria below).

2. Evidence of significant independent contribution to the design and execution of research.

3. An emerging track record of publications in reputable journals and other appropriate media of similar standing.

4. Excellent presentation skills, with the ability to communicate effectively, both orally and in writing, with students, colleagues and external audiences.

5. Ability to work individually on own initiative and without close supervision, and as part of a team.

6. Ability to exercise a degree of innovation and creative problem-solving.

7. Excellent organisational and administrative skills.

8. Ability to prioritise and meet deadlines.

9. Excellent IT skills.

ESSENTIAL ROLE-SPECIFIC CRITERIA

1. Extensive relevant experience of the design and development of radiation detection and measurement instrumentation.

2. Extensive relevant understanding of semiconductor radiation detectors and their characterisation.

3. A clear commitment to sustaining, growing, and achieving excellence in research and commercialisation activities.

4. A clear ability to operate successfully with minimal supervision.

5. World-leading experimental skills.

6. Demonstrated ability to write high quality reports and documents in English.

DESIRABLE CRITERIA

1. Experience of generating research or knowledge exchange income.

2. Experience of supervising postgraduate research students.

3. Extensive relevant experience of the design and development of novel compound semiconductor X-ray spectrometers from scratch.

4. Extensive relevant experience of developing X-ray fluorescence spectroscopy instrumentation.

5. Extensive relevant experience of development of low-noise charge-sensitive preamplifiers for radiation detection.

6. Extensive relevant experience of the characterisation of compound semiconductor spectroscopic photon counting X-ray detectors.

7. Extensive relevant experience of the design and development of instrumentation and systems for space science, defence technology, nuclear applications, ocean exploration, oil and gas or mining, or other harsh environments.

8. Relevant mechanical and/or electronic workshop skills e.g. operation of milling machines, 3D printers, PCB production, electronic component soldering to high standards (e.g. to NASA workmanship standards).

9. Extensive experience of day-to-day management of a physical science laboratory or workshop.

10. Extensive experience of working with radiation sources or supervising work with radiation sources.

11. Extensive experience of computer aided design

12. A clear commitment to sustaining, growing, and achieving excellence in research and commercialisation activities.