

Research Role Profile

Job Title:	Research Fellow A
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Responsible to:	Principal Investigator
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Responsible for:	Not applicable
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Job Summary and Purpose:

To undertake research in accordance with the specified research project(s) under the supervision of the principal investigator.

Main Responsibilities/Activities

To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.

Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.

Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.

To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.

To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder's area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.

The post holder may occasionally be required to supervise more junior research staff.

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Person Specification

The post holder must have:

A doctoral degree in a relevant discipline although individuals who have almost completed a doctoral degree may be appointed. Consideration will also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields

The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results.

Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions.

Special Requirements

To be available to participate in fieldwork as required by the specified research project

All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
 - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
 - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

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Addendum to Role Profile

Job Title: Research Fellow in Space Weather and Atmospheric Radiation Modelling	Research Fellow (1A)
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<p>Job Summary and Purpose:</p> <p>The Surrey Space Centre (SSC) is a world leading hub for space radiation and space weather research. SSC is just beginning a new 3-year NERC-funded project on Space Weather Atmospheric Radiation Modelling (SWARM) which will develop a new data-driven atmospheric radiation model (Model for Atmospheric Ionising Radiation Environments) based on an existing prototype to enable the Met Office to nowcast the secondary particle fluxes, biological dose rates and electronic upset/failure rates throughout the atmosphere arising from both galactic cosmic rays and GLEs. To drive MAIRE+, real-time ground level neutron monitor data, geomagnetic disturbance indices and sunspot indices will be used. Global maps based on an international global grid (15 degrees longitude, 10 degrees latitude) covering altitudes up to 60kft with 3kft altitude resolution will be provided. The dose rate maps will allow Met Office to issue alerts based on international thresholds for the affected regions. Internal models and tools will be revised to account for the most recent scientific advances, including updating cosmic ray and magnetic field models and improving calculations of biological dose and upset/failure rates in electronics.</p> <p>Therefore the SSC is looking to recruit a Research Fellow to contribute to the new MAIRE model development and implementation. Key functions of the role are improving model physics, implementing and testing high reliability software for the model (including for real time data driven processes) and developing user interfaces/visualisations.</p>
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<p>Main Responsibilities/Activities</p> <p>The Research Fellow will contribute to work in some of the following areas:</p> <ul style="list-style-type: none"> • improving and developing the underlying physics of MAIRE including space weather radiation environments, radiation transport and radiation effects in materials/tissue • implementing high reliability software of MAIRE model within application constraints (e.g. speeds for real time applications, practical computing constraints, need for good quality visualisation)

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- maintaining the MAIRE model software and its interfaces with Met Office and public interfaces (where applicable) such as a web site access
- validation of the MAIRE model using historic data and new data sources (neutron monitors and aircraft radiation detectors) including data set management and acquisition of new data for validation where applicable
- development and recording of emerging requirements for the models in association with the UK Met Office and other Stakeholders
- liaising with project partners contributing on solar particle propagation physics, solar precursors and geomagnetic models.

It is recognised that one individual may not be immediately able to contribute across all the aspects listed above. In all areas supervision and training will be provided.

Person Specification

The post holder must have:

Basics:

- A relevant PhD (or at least soon to be obtained) or equivalent research experience
- Experience in software

A broad knowledge in some, but not necessarily all, of the following is required:

- Space weather, radiation environment models and effects
- Radiation transport theory and simulation codes such as Geant4, FLUKA, MCNP.
- Programming in languages such as Python, Fortran, Java, C++
- Some experience of Linux, GitHub, AWS, Docker

Good written and verbal communication skills are required alongside a team-oriented approach.

Relationships and Contacts

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The post holder will report to the PI Dr Keith Ryden (k.ryden@surrey.ac.uk), but on a day-to-day basis work they will work closely with the project Senior Research Fellow and software modelling lead Dr Fan Lei. Interactions with external stakeholders such as the UK Met Office will be expected.

The post holder will work within the Surrey Space Centre. Both remote-- and campus-working will be anticipated.