

## Candidate Information

<b>Position:</b>	Research Fellow
<b>School/Department:</b>	Centre for Wireless Innovation
<b>Reference:</b>	24/111600
<b>Closing Date:</b>	Monday 19 February 2024
<b>Salary:</b>	£37,841 per annum
<b>Anticipated Interview Date:</b>	Friday 8 March 2024
<b>Duration:</b>	Fixed term contract for 30 months, or available until 31/03/2027, whichever is sooner.

### JOB PURPOSE:

Conduct in-depth research in Electromagnetics and Information Theory (EIT). Investigate and apply EIT concepts to model and analyse signal transmission mechanisms in spatially continuous EM fields. Develop methodologies for EM channel modelling and EM noise analysis. Utilize mathematical tools, including degrees of freedom and random field theories, for performance analysis based on EIT. Explore applications of EIT-inspired technologies to stress test the theoretical limits of EM systems.

This is a unique opportunity to build the next generation electromagnetic systems and work at one of the leading institutions in the UK in microwave technology, the Centre for Wireless Innovation – Queen's University Belfast, collaborating with a UK-wide team of academics and industry partners.

### MAJOR DUTIES:

1. Undertake research under supervision within the specific research project and, as a member of the collaborative research team, lead research within the EM Information Theory (EIT) framework, collaborating with the wider research team.
2. Investigating theoretical limitations in EM systems, making significant contributions to the advancement of EIT.
3. Execute in-depth analyses, experimental tests, critical evaluations, and implementations using field-appropriate methodologies and techniques.
4. Interpret simulation/experimental data and relevant literature to deepen Electromagnetic Environment (EME) Hub understanding of information transmission/reception in spatially continuous EM fields, aligning with wider research objectives.
5. Carry out educational supervision of the EME-Hub PhD students under the guidance of the project investigator team.
6. In consultation with project investigators and collaborators, prepare material for publication in prestigious leading journals and presentations at major international conferences to disseminate and publicise research findings.
7. Produce high-quality research outputs consistent with project aims and commensurate with the career stage. This includes collaborating with the wider EME Hub team (as appropriate) on outputs.
8. In consultation with the project team, promote research milestones and outputs at EM workshops and promotion events.
9. Assist EM Hub members in preparing funding proposals and applications to external bodies.
10. Undertake supplementary duties relevant to the success of the EME Hub at QUB, including presentation of regular progress reports and additional training and development activities as required.
11. Keep abreast of new developments in specialism and related research areas/disciplines. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

### ESSENTIAL CRITERIA:

1. Normally have or be about to obtain a PhD in a relevant area.

2. Relevant research experience, including:
  - Design and implementation of MIMO and massive MIMO systems.
  - Demonstrable knowledge of antenna theory, transmission line theory and electromagnetic theory.
  - Experience using modelling tools, such as MATLAB, Python, CST, FEKO, and/or HFSS.
  - Experience in MIMO systems and models including white-noised, scalar-quantity, far-field, discretized, and monochromatic EM fields.
3. Strong publication record commensurate with stage of career.
4. Ability to contribute to broader management and administrative processes.
5. Contribute to the School's outreach programme by links with industry, community groups etc.
6. Evidence of strong analytical and problem solving skills.
7. Ability to communicate complex information effectively in oral and written format.
8. Ability to build relationships to develop internal and external networks.

**DESIRABLE CRITERIA:**

1. A PhD in the field of antennas and propagation.
2. Hold a master's in the field of antennas and propagation.
3. Additional evidence of:
  - Knowledge of high-frequency electronics and multi-antenna systems.
  - Experience in multi-antennas system prototyping.
  - Experience with MATLAB and/or Python.
  - Desirable to have experience with CST, FEKO and/or HFSS.
  - Desirable to have experience in far-field/near-field measurements.
4. Project management experience.
5. Experience in funding proposal writing.