

Candidate Information

Position:	Research Fellow
School/Department:	Centre for Wireless Innovation
Reference:	20/108417
Closing Date:	Wednesday 2 December 2020
Salary:	£33,797 to £36,914 per annum
Anticipated Interview Date:	Tuesday 5 January 2021
Duration:	12 months

JOB PURPOSE:

Applications are invited for a postdoctoral position available for 12 months to develop electromagnetic (EM) metasurface techniques at the Institute of Electronics, Communications and Information Technology (ECIT), School of Electronics, Electrical Engineering and Computer Science (EEECs), Queen's University Belfast. In this research, we will develop EM metasurfaces for the detection of air borne virus load indoors.

Awareness of nano sized particles in the multipath propagating environment, may be used for virus detection/suppression.

Metasurfaces may provide solutions for facilitating resolution to this class of problem. These metasurfaces provide an aperture that can generate, controlled radiation patterns. These field patterns can then be used to detect nano air borne particles thereby facilitating their detection in the radio propagation channel. The overall effect may result in significantly simplified systems for the detection of air borne viruses.

MAJOR DUTIES:

1. Develop, design, simulate, fabricate and measure EM metasurfaces for air borne virus sensing in the electromagnetic propagation channel.
2. Investigate new methods to exploit the mode diversity afforded by these systems.
3. As part of a research team, verify the operation of a prototype system by simulation and measurement.
4. Present regular progress reports to members of the research team.
5. Prepare, in consultation with line manager, material for publication in prestigious leading journals and presentations at major international conferences to disseminate and publicise research findings.
6. Assist as required in the preparation of funding proposals.
7. Carry out, if required, occasional undergraduate and postgraduate supervisions, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
8. Carry out administrative tasks associated with the research project to ensure that project is completed on time and within budget, including organisation of project meetings and documentation, risk assessment of research activities, etc.
9. Keep abreast of new developments in own specialism and related research areas/disciplines.

Planning and Organising:

1. Plan details of the research programme and carefully align them with the goals of the research programme.
2. Plan for the use of research resources, laboratories and workshops where appropriate, in order to ensure that facilities are available at required times.
3. Plan own day-to day activity within framework of the agreed research programme.
4. Plan in advance to meet deadlines for internal/external progress reports, conference and journal publications.
5. Coordinate and liaise with other members of the research team over work progress.

Resource Management Responsibilities:

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance as required to support staff and any students who may be assisting with research.

Internal and External Relationships:

1. Liaise on a regular basis with colleagues, students and industry.
2. Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
3. Join external networks at national and international levels to share information and ideas.

ESSENTIAL CRITERIA:

1. Hold or be about to obtain (within three months) a PhD in microwave engineering or physics focusing on metasurface scattering theory and techniques.
2. At least a 2.1 undergraduate's degree in electrical/electronic engineering.
3. At least 3 years relevant research experience in metasurface techniques.
4. Experience with CoMSol and electromagnetic simulation software, such as CST Microwave Studio.
5. Experience in conducting measurements and characterisation of microwave and mmW devices using measurement equipment such as vector network analysers, RF anechoic chambers, near-field scanners, etc.
6. A publication record in line with stage of career in prestigious leading journals (e.g. IEEE, Journal of Physics, Nature) and presentations at major international conferences.
7. Ability to contribute to broader management and administrative processes.
8. Contribute to the School's outreach programme by links with industry, community groups etc.
9. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
10. Strong analytical and problem solving skills.
11. Ability to communicate complex information clearly.
12. Ability to build contacts and participate in internal and external networks.
13. Demonstrable intellectual ability.
14. Ability to assess and organise resources.

DESIRABLE CRITERIA:

1. A PhD with emphasis on metasurface theory and implementation with preference for core-shell structures.
2. Experience in solving electromagnetic and inverse problems.