

Candidate Information

Position:	Research Fellow - Intelligent metasurfaces for wireless power transfer
School/Department:	Centre for Wireless Innovation
Reference:	21/109354
Closing Date:	Thursday 9 December 2021
Salary:	£34,304 - £35,326 per annum
Anticipated Interview Date:	Monday 20 December 2021
Duration:	FTC – 36 Months

JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of the ERC Consolidator Grant BEATRICE: Beyond Massive MIMO: Living at the Interface of Electromagnetics and Information Theory, led by Professor Michalis Matthaiou. As an active member of the research project/team you will assist in the development of research proposals and the planning and delivery of the research activity specifically amalgamate communication theory with electromagnetic theory to develop new solutions for achieving efficient wireless power transfer through a reflective intelligent metasurface. These new architectures should offer remote charging from a standoff distance.

The post is a critical role, and as such, successful applicants will have responsibilities in independent research, supervision, planning, collaborations, and outreach. The candidate will also become an active member of the Centre for Wireless Innovation and the School of EECS at QUB, assisting in the production of world leading research output and teaching activities.

MAJOR DUTIES:

1. Undertake research under supervision within the specific research project and as a member of a research team.
2. Design, develop and refine research using a range of experimental models. This would include:
 - o Develop a holistic communication theoretic framework for wireless power transfer (WPT) using knowledge of the electromagnetic characteristics of reflecting intelligent metasurfaces (RIS).
 - o Topological design of RIS to achieve efficient wireless power transfer in the near-field at the resonance frequency.
 - o Hardware-informed characterisation of RIS, e.g. Q-factor, operating bandwidth.
3. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to experimental computing systems for example evaluate the performance of the proposed solutions in MATLAB and CST.
4. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
5. In consultation with the project team, promote research milestones and outputs at national and international conferences and through social media (where applicable).
6. Assist grant holder in the preparation of funding proposals and applications to external bodies.
7. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
8. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

Planning and Organising:

1. Plan own day-to day activity within framework of the agreed research programme.
2. Contribute to the planning of research project, reports and publications etc.
3. Assist PI and project team in organising relevant dissemination events in the context of ERC project.

Resource Management Responsibilities:

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance, as required, to ensure a safe working environment.

Internal and External Relationships:

1. Liaise on a regular basis with members of the project team.
2. Liaise on a regular basis with project partners and with the European Research Council.
3. Build contacts with relevant stakeholders to form relationships for future collaboration and project dissemination.

ESSENTIAL CRITERIA:

1. At least 2:1 honours degree in Electronics, Electrical Engineering, or closely related discipline.
2. Have, or be about to obtain, a relevant PhD in Electronics, Electrical Engineering, or closely related discipline.
3. At least 3 years relevant research experience to include:
 - Undertaking research in the area of communication theory and electromagnetic theory for future wireless networks
 - A proven track record of using communication theoretic or electromagnetic numerical models to carry out analyses, critical evaluations, and interpretations of experimental data relevant to the research project
 - Working effectively as part of a research team in the development and promotion of the research theme.
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. Practical problem solving skills, independence of thought and initiative.
7. Ability to assess and organise resources.
8. Ability to communicate complex information in English effectively in oral and written format.
9. Ability to build relationships to develop internal and external networks.
10. Commitment to continuous professional development.
11. Ability to meet the mobility requirements of the post this may include travel and presentation at project meetings, and international conferences.

DESIRABLE CRITERIA:

1. Strong background in communication theory and electromagnetism.
2. Experience with intelligent reflecting metasurfaces and wireless power transfer.
3. Previous experience of carrying out relevant educational supervision, demonstrating or lecturing duties.
4. Experience in EU or RCUK projects, in particular in project task management and reporting through periodic deliverables.
5. Experience working with external industrial or academic partners.
6. Experience in producing timely technical documentation on research projects (deliverables, reports).
7. Experience with presentations of research outputs in conferences, workshops, or seminars.