UNIVERSITY OF LEICESTER

Job Title:	Research Associate in MRI Physics (Cardiovascular Imaging)
Salary:	£39,906 to £46,049 per annum
Grade:	7
Department:	Division of Cardiovascular Sciences, School of Medical Sciences
Hours/Contract:	Full-time 37.5hpw/Fixed term for 3 years (potential extension to 5 years)
Job Family:	Teaching and Research
Job Reference:	13189

Role Purpose

This post comprises part of the support awarded to Professor Gerry McCann by a British Heart Foundation (BHF) Chair of Cardiology. The post holder will work collaboratively and independently as part of a multidisciplinary research team to deliver defined milestones and produce high-quality research aligned with the strategic objectives of the award.

We are seeking a highly motivated MRI Physicist to join a multidisciplinary team working at the interface of imaging science, engineering, artificial intelligence, and clinical translation. The post holder will contribute to the development, optimisation, and clinical translation of advanced cardiovascular MRI techniques, with a particular focus on cardiac diffusion tensor imaging (DTI) and emerging quantitative imaging biomarkers.

The role will involve novel MRI sequence development, optimisation of diffusion tensor imaging protocols, implementation of AI and deep learning approaches for image reconstruction and denoising, and quantitative microstructural phenotyping in cardiovascular disease. The programme focuses on 3 main areas: diabetes and heart failure, aortic stenosis and coronary artery disease.

The post holder will work closely with Dr Maryam Afzali, Lecturer in MRI Physics, and will report to Professor Gerry McCann. The overarching goal is to improve disease phenotyping, risk stratification, and accelerate the translation of advanced MRI techniques into clinical research studies.

The role involves close collaboration with clinicians, radiographers, engineers, data scientists, and researchers within the Cardiovascular Research Centre and NIHR infrastructure. Responsibilities include sequence development and optimisation, image reconstruction and analysis, scanner performance evaluation, support for research protocols, and contribution to grant-funded projects, publications, and supervision of students or junior researchers where appropriate.

Main Duties and Responsibilities
Research   • To undertake work aligned to the BHF Research Professorship, taking responsibility for specific elements of advanced cardiac MRI development and implementation.   • To lead in the collection, evaluation and interpretation of the research data, including experimental design and performance, MRI protocol optimisation, sequence development, quantitative analysis and work autonomously to attain project milestones.   • To contribute to the development and optimisation of cardiac diffusion tensor imaging (DTI) techniques, including motion-robust acquisition strategies and acceleration approaches.

- To develop and apply advanced image reconstruction and analysis pipelines, including the implementation of machine learning and deep learning techniques (e.g., convolutional neural networks) for denoising and reconstruction from under-sampled data.
- To contribute to the overall research programme using innovative research models, novel approaches, and quantitative imaging techniques aimed at improving microstructural phenotyping in cardiovascular disease.
- In agreement with the line manager, liaise with project collaborators, including clinical and methodological partners, to progress translational research objectives.
- To lead in writing up research findings for dissemination amongst the research team and broader international community, and develop ideas and contributions for future grants, technical outputs.
- To represent the research group by disseminating results/findings at national and international conferences and broader community.
- To contribute to research outputs as a co-author to journal articles, technical papers, monograph, book chapter.
- To contribute to the writing of research bids/grants.
- With the support of colleagues, identify opportunities to apply for fellowships and/or further project grants
- To provide guidance to other staff and students (involved in the cardiovascular imaging research programme).
- To actively seek opportunities to carry out multi-disciplinary research with other research groups at the University or stakeholders external to the University, with the approval of the Principal Investigator (PI).

Professional Development

- Duties and opportunities to engage in work that support your own professional development, including development of expertise in advanced cardiac MRI, AI-enabled imaging, quantitative image analysis, statistical analysis of imaging and clinical data, and translational cardiovascular research, including experience in clinical research design and trials.

Impact and Knowledge Exchange

- Network and contribute to the maintaining and furthering of the wider cardiovascular imaging programme and research area
- To contribute to industry collaborations, particularly where relevant to MRI hardware, software development, or AI-based reconstruction tools.
- To consult effectively on own specialism directly with people external to the University, including clinical and academic collaborators.
- To engage positively and pro-actively in research impact activities, supporting translation of advanced imaging techniques into clinical research and ultimately patient benefit.

Leadership and Citizenship

- Guidance to other team members both research staff and students, particularly in MRI acquisition, reconstruction, and analysis methods.
- Pro-actively build networks and collaborations across imaging science, clinical cardiology, and computational disciplines.
- Providing mentoring and coaching to Early Career Researchers and research students.

Internal and External Relationships

- Regular meetings with members of the programme research group and Dr Afzali (weekly in the first instance) and at least monthly with Professor McCann
- Meeting members of the department of Cardiovascular Sciences and affiliated research centres for critical discussion of the research and exchange of new ideas and approaches that might benefit the research
- Liaison with external collaborators including clinical partners, academic collaborators, and industry stakeholders involved in MRI technology and AI development.
- NHS staff
- NHS patients

Planning and Organising

You will be required to effectively manage your time to plan your research activity and to deliver on the priorities of the BHF-funded Chair:

- Prioritise tasks within agreed work schedules and project timelines;
- Plan for specific aspects of research incorporating issues such as deadlines, project milestones and overall research aims;
- Adapt daily and weekly plans to accommodate new developments in sequence optimisation, scanner availability, and be flexible to the changing priorities of the research project

Qualifications, Knowledge and Experience

Essential

- PhD or equivalent in MRI Physics, Medical Physics, Biomedical Engineering, Applied Mathematics, or a related discipline*
- Expertise in MRI physics and advanced imaging techniques*
- Evidence of a contribution to peer-reviewed journal papers or equivalent e.g technical report/writing a piece of software tools, reconstruction pipelines*
- Evidence of proven analytical problem-solving capability *
- Expertise in relevant approaches/models and analytical techniques and ability to develop new ones where required.
- Proficiency in programming languages such as Python, C++, or MATLAB*

Desirable

- A strong background in cardiovascular MRI would be advantageous*
- Experience in cardiac diffusion tensor imaging
- Experience in machine learning or deep learning methods applied to imaging
- First-author publications in MRI-related journals
- Clear trajectory toward developing research independence

Skills, Abilities and Competencies

Essential

- Willingness and ability to work with internal and external stakeholders*
- Evidence of continued development of subject expertise*
- Excellent communication skills – written and verbal evidenced by the ability to communicate complex information *
- Evidence of working effectively as part of a multidisciplinary team and the ability to work independently *
- Working towards independence and ability to be involved in collaborative research
- Evidence and commitment to Continuous Professional Development (CPD) for yourself, and encourage commitment to learn and develop in others
- Collegiate and supportive member of a research team

Desirable

- Budget management skills

Criteria to be used in shortlisting candidates for interview

Reason for Fixed Term Contract

The reason for the fixed term contract is stated in section 1.9 in the summary of contractual terms in your contract of employment.

NHS Research Governance

Where it is determined that the duties of this post for the purposes of research involve work with the NHS, it is necessary to ensure that the performance of the duties attached to the post are covered by NHS research governance arrangements and the appointee must comply with all such arrangements, including DBS & occupational health clearance.

Criminal Declaration and Disclosure and Barring Service (DBS)

If you become an employee, you must inform your manager immediately, in writing, if you are the subject of any current or future police investigations/legal proceedings, which could result in a criminal office, conviction, caution, bind-over or charges, or warnings.

This post is exempt from the Rehabilitation of Offenders Act 1974 because the appointee will have substantial access to young people and/or vulnerable adults. Therefore, an appointment to this post will be subject to checking through the Disclosure and Barring Service (DBS). The successful applicant for this post will, therefore, be required to give consent for the University to check and obtain appropriate clearance with the DBS for the existence and content of any criminal record in the form of a Standard. Disclosure.

Information received from the DBS and the police will be kept in strict confidence and will be destroyed once the University is satisfied in this regard.

Supporting University Activities

As a University of Leicester citizen, you are encouraged to support key university activities such as clearing, graduation ceremonies, student registration and recruitment open days. We encourage all staff as citizens to work flexibly across the University if required. If supporting these activities is likely to affect your workload, please speak to your line manager in the first instance

University Values

Inclusive - We are diverse in our makeup and united in ambition. Our diversity is our strength and makes our community stronger.

Inspiring - We are passionate about inspiring individuals to succeed and realise their ambitions. We challenge our community to think differently, to get involved, and to constantly embrace new ideas.

Impactful - As Citizens of Change we will generate new ideas which deliver impact and empower our community

Freedom of Speech

The University is committed to upholding freedom of speech and academic freedom within the law throughout our recruitment processes. We ensure that all candidates are considered based on merit and suitability for the role, without regard to their lawful viewpoints or the expression of challenging or controversial ideas. Our recruitment policies and practices are designed to protect applicants from discrimination or adverse treatment on the basis of their opinions, and to foster an environment where open debate and diverse perspectives are valued as essential to our academic mission.

Equity and Diversity

We believe that equity, diversity and inclusion is integral to a successful modern workplace. By developing and implementing policies and systems that challenge stereotypes across all aspects of our work, we have a culture that recognises and values the diverse contributions of our staff which benefits everyone. Our strong values of inclusivity and equity support our efforts to attract a diverse range of high quality staff and students, and identify our University as a progressive and innovative workplace that mainstreams equity, diversity and inclusion.