UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Marie Skłodowska-Curie Doctoral Researcher in Acoustic and mechanical metamaterials for biomedical and energy harvesting applications – ‘MetacMed’

Faculty of Engineering and Physical Sciences

Salary: In line with Marie Skłodowska-Curie Doctoral Network

Reference: EPSEE1134

Closing date: Sunday 20 October 2024

Fixed term for 3 years

We are open to discussing flexible working arrangements

Marie Skłodowska-Curie Doctoral candidate Researcher in Acoustic and mechanical metamaterials for biomedical and energy harvesting applications – 'MetacMed', School of Electronic and Electrical Engineering.

Are you an early career researcher looking for your first challenge? Do you have a background in metamaterials and/or ultrasonics? Do you want to further your career in one of the UK's leading research-intensive universities?

Applications are invited from suitable qualified candidates for a full time, fixed-term position of 36 months duration as a Doctoral Candidate (DC) at the University of Leeds, UK. This position is DC6, is funded in the UK by UK Research and Innovation (UKRI), and is one of 12 DCs being recruited as a part of the Marie Skłodowska-Curie Doctoral Network on ***Acoustic and mechanical metamaterials for biomedical and energy harvesting applications – 'MetacMed'***, GRANT-101119738, see www.metacmed.eu. The successful applicant will be enrolled on a PhD programme within the School of Electronic and Electrical Engineering, University of Leeds, and will work on the topic of "*Metamaterial adaptive filters for harmonic imaging in clinical applications*" under the supervision of Professor Steven Freear. There are planned secondments to the University of Calabria, Italy, for 5 months during the second year of funding, and to Amazemet, Poland, for 2 months during the third year of funding.

The MetacMed doctoral network aims to link basic research on acoustic and mechanical metamaterials to health and well-being issues. Each DC will consider ways in which human health can be improved using metamaterials, e.g. improvement in the resolution of biomedical ultrasound imaging for cancer diagnosis, the design of better spinal implants, monitoring of bone healing, and the use of insoles to aid human walking. Another area of interest is to develop metamaterials that can be used for energy harvesting, to better power e.g. medical devices, and reduce reliance on conventional power sources. These are all backed up by fundamental studies into the metamaterials themselves to provide the background to achieve these tasks. The balance of the network has thus been carefully considered in terms of basic science and applications, with input from industry in areas such as metamaterial fabrication and exploitation. Associated with the above is a strong set of training events and tailored secondment periods at both associated partners and beneficiaries. Please visit www.metacmed.eu for further information.

Important eligibility rules for this position:

There are no restrictions on the nationality, but

- Applicants must not already be in possession of a doctoral degree at the time of recruitment;
- At the time of recruitment, applicants must not have resided or carried out their main activity (i.e. work, studies, etc.) in the UK for more than 12 months in the 3 years immediately prior to their recruitment under the "*Metamaterial adaptive filters for harmonic imaging in clinical applications*" project. Compulsory national service and/or short stays such as holidays are not taken into account.

Salary:

- This full-time position will be available, subject to funding, from October 2024 and offered on a fixed-term 36-month contract. The successful candidate will receive a highly competitive and attractive salary in accordance with the Marie Skłodowska Curie regulations. The exact salary will be confirmed upon offer and will be based on a living allowance of €4654.60 per month and a mobility allowance of €600 per month. Additionally, you may also qualify for a family allowance of €660 per month depending on personal circumstances. The final salary will be confirmed upon offer and will be subject to tax and employer's and employee's National Insurance deductions and will be paid in UK Sterling (£) using an appropriate conversion rate.

What does the role entail?

As a Marie Skłodowska-Curie Doctoral Candidate Researcher, your main duties will include:

- Designing and fabricating new phononic crystals/metamaterials that can be used to block frequencies over a defined ultrasonic bandwidth in a water environment;
- Establishing the efficiency of phononic crystals/metamaterials at blocking a fundamental frequency f0 but allowing transmission of subharmonics (f0/2), and ultra-harmonics (3f0/2) that would arise from a scattered signal;
- Experimentally investigating responses of the manufactured phononic crystals/metamaterials in a water tank with ultrasound microbubble contrast agents;

- Investigating operation in phantoms for vascular structures containing ultrasound microbubble contrast agents;
- Measuring imaging resolutions that arise only from the contrast agents and not from surrounding areas using ultrasonic arrays;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals and by presentation at national and international meetings;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own research;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Marie Skłodowska-Curie Doctoral Candidate Researcher, you will have:

- A first class or 2:1 undergraduate degree and/or a Master's degree (or equivalent degree) in Engineering, Physics, Material Sciences, Mathematics, Computing or a closely related discipline;
- Satisfy the eligibility requirements set for a Doctoral Candidate Researcher funded by Marie Skłodowska-Curie scheme – this means:
    - At the time of recruitment, applicants must not already be in possession of a doctoral degree;

    - At the time of recruitment, applicants must not have resided or carried out their main activity (i.e. work, studies, etc.) in the UK for more than 12 months in the 3 years immediately prior to their recruitment under the *'Marie Skłodowska-Curie Doctoral Researcher in Acoustic and mechanical metamaterials for biomedical and energy harvesting applications – 'MetacMed'project'*. Compulsory national service and/or short stays such as holidays are not taken into account.
- Satisfy the eligibility requirements to enrol on a PhD degree. This includes acceptable English language requirements if English is not your first language;
- Ability to and commitment to producing scientific outputs for publication in peer reviewed journals;
- Highly proactive, and an excellent track record of academic achievement;
- Are willing to travel to attend secondments, training and academic events;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- Excellent communication skills both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both independently and in a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of publishing scientific work in peer reviewed journals;
- Experience of pursuing external funding to support research;
- Experience of modelling, designing and characterising acoustic/mechanical metamaterials;
- Experience of operating open ultrasound research platforms.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Professor Steven Freear, Professor of Ultrasonics and Embedded Systems
Tel: +44 (0)113 343 2076
Email: S.Freear@leeds.ac.uk

Additional information

For informal inquiries about MetacMed, please contact Dr Stefano Laureti at info@metacmed.eu. For further information, please also see the MetacMed Call for Applicants (download here) and have a look at the MetacMed website (www.metacmed.eu) to stay up-to-date!

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Electronic and Electrical Engineering.

A diverse workforce
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Working at Leeds
We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at hr@leeds.ac.uk

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.

Salary Requirements of the Skilled Worker Visa Route

Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit: www.gov.uk/skilled-worker-visa.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit: https://www.gov.uk/global-talent.