UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Laser Surface Texturing for Aerodynamic Drag Reduction, Faculty of Engineering and Physical Sciences

Salary: Grade 7 (£39,355 – £46,735 p.a.) Due to funding restrictions, an appointment will not be made higher than £39,355 p.a.

Reporting to: Dr Andrew Shires

Reference: EPSME1194

Closing date: Wednesday 23 July 2025

Location: University of Leeds main campus and Manufacturing Technology Centre Liverpool

Fixed-term until 31 March 2026 – to complete specific time limited work

We are open to discussing flexible working arrangements

Research Fellow in Laser Surface Texturing for Aerodynamic Drag Reduction,
Institute of Thermofluids,
School of Mechanical Engineering.

Are you a researcher looking for your first challenge? Do you have a background in computational fluid dynamics and in modelling turbulent boundary-layer behaviour? Do you want to further your career in one of the UK's leading research-intensive universities?

This is a short-term position to evaluate a method of engraining microscale riblet-like structures on the surface of aerospace vehicles using laser texturing. Riblets are streamwise grooves on a surface that have been shown to reduce skin friction drag in flows with turbulent boundary layers, with aerospace and marine applications. The small streamwise grooves mimic the denticles of shark skin.

The role will use your skills in computational fluid dynamics (CFD) to develop a computational modelling framework using large eddy simulation (LES). This framework will determine the effect of surface texturing on sub-boundary layer flow structures and skin friction at typical aerospace Reynolds numbers, allowing a detailed understanding of this interaction to be elucidated. You will have a background in CFD and fluid mechanics and experience in modelling turbulent boundary-layer behaviour, as well as being able to demonstrate innovative approaches to solving problems.

This post will see you working with an industry partner who are expert in advanced manufacturing and computational mechanics modelling. You will be based in Leeds but expected to travel in the UK to work alongside this industry partner. You will also use your skills in interdisciplinary research to communicate your findings to researchers with a range of backgrounds.

The project is in collaboration with the Manufacturing Technology Centre, who are expert in advanced manufacturing and computational mechanics modelling, and you will be expected to spend approximately 100 days at their Liverpool office working with their modelling team.


What does the role entail

As a Research Fellow, your main duties will include:

- Lead the development and validation of a computational modelling framework using large eddy simulation (LES) for riblet-like structures;
- Characterise the surface structures that can be achieved using the advanced laser texturing facilities at the MTC;
- Model the effect of surface texturing on sub-boundary layer flow structures and skin friction at typical aerospace Reynolds numbers;
- Collation of data and interpretation of findings, and presenting these to industrial and academic partners in order to review progress;
- 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;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own research;
- 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;
- 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 Research Fellow, you will have:

- A PhD (or have submitted your thesis before taking up the role) in Mechanical Engineering or a closely allied discipline;
- A strong background in fluid mechanics and RANS/LES CFD applications, preferably with knowledge of boundary-layer flows and using the Fluent CFD package;
- An innovative mindset around your research demonstrating the ability to establish new approaches and techniques;
- The ability to work with scientists and researchers with a range of backgrounds;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- A developing track record of peer-reviewed publications in international journals;
- 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 pursuing external funding to support research.

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:

Dr Andrew Shires, Associate Professor Aeronautical and Aerospace Engineering
Email: A.Shires@leeds.ac.uk

Additional information

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 Mechanical Engineering.

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.

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.

Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our How to Apply information page or by getting in touch by emailing HR via 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 the Government's Skilled Worker visa page.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit the Government's page, Apply for the Global Talent visa.