
ENGINEERING SCIENCE

Job title	Icing at Altitude Wind Tunnel Project Engineer
Division	Mathematical, Physical and Life Sciences Division
Department	Engineering Science
Location	Department of Engineering Science, Southwell Lab, Osney, Oxford
Grade and salary	Grade 7: £37,524 - £45,763 per annum, with a discretionary range up to £49,850 per annum, including Oxford University Weighting (OUW)
Hours	Full time
Contract type	Fixed term for 2 years
Reporting to	David Gillespie, Associate Professor
Vacancy reference	173760

The role

The Department of Engineering Science at Oxford University has strong research expertise in aero-engine icing, generated in collaboration with Rolls-Royce, one of the global leaders in jet-engine design and manufacture.

The Osney Thermofluids Institute is a member of the National Wind Tunnel Facility (NWTF), a consortium of UK universities developing specialised wind tunnels for academic and commercial use. A recent funding award has facilitated the development of a major new facility, unique in Europe, to replicate the glaciated ice and high altitude conditions under which ice forms inside jet engines (the Icing at **Altitude Wind Tunnel, IAWT**). This will be achieved by building a multipurpose test section in a large atmospherically controlled chamber, with flow rates of up to Mach 0.6 at 0.1 bar passing through the test section. The facility will require the installation of a major new vacuum pump facility (~1MW), the altitude test chamber, a means to generate ice particles, a temperature and humidity controlled air supply and associated control and measurement instrumentation.

Based at the Osney Thermofluids Laboratory (Osney Mead, Oxford) the *IAWT Project Engineer* will be working in a team that will be responsible for the design, procurement and installation of the upgraded test facility. This will require: a good understanding of aspects of mechanical and



thermal engineering; appreciation and understanding of the research requirements; specification of vacuum pump installation including, cooling water recycling, storage vessels, industrial air heaters chillers and air vessels; pipework feed system design; facility exit silencer design and installation, communication and management of outside contractors and consultants; procurement organisation; PLC and data acquisition system design; CAD modelling of basic components; oversight of CAD drawings; organisation of design and safety documentation. The successful candidate will be expected to work closely with the whole OTI Particles team, including academics, test controllers, technicians and DPhil research students, and to contribute to reporting to sponsors, and to present regularly on their work both within the lab and at larger reviews.

This position is technical and requires a candidate with good knowledge of mechanical design, heat transfer principles, detailed engineering design, and have experience of equipment procurement, tender processes and management of complex projects.

The post is fully funded by the NWTF+ research programme and the initial appointment will be for 2 years with the possibility of extension. The postholder will be a self-motivated and driven individual who excels at working in a team.

Responsibilities

Specific Tasks

- Specification of vacuum pumps to meet the research needs, and associated cooling and water management, noise and vibration abatement
- Specification of facility pipework feed system.
- Design calculations. This will require familiarity with FE calculations, CFD techniques, analytical calculations methods, good design practices etc.
- Procurement of equipment using standard tender processes and liaising with University Purchasing department
- Working with equipment manufacturers to ensure timely delivery and equipment installation requirements are met
- Design of a major new experimental facility and associated measurement systems in collaboration with other group members
- Organisation and creation of high quality technical design documentation including CAD drawings, design calculations, certification documentation, etc
- Detailed design and manufacturing of the new turbine working section
- Assisting facility test controllers / technicians during assembly of the new test section
- Commissioning of the components
- Presentation of work to collaborators and project funding body

Additional Tasks

- Use specialist scientific equipment in a laboratory environment
- Represent the research group at external meetings/seminars, either with other members of the group or alone
- Carry out collaborative projects with colleagues in partner institutions, and research groups
- Any other duties appropriate with the role.

Selection criteria

Essential

- A university master's degree in mechanical engineering or a similar discipline
- Experience in mechanical design, heat transfer principles and detailed engineering design.
- Knowledge of design practices, e.g. pressure safety regulations
- Experience in communicating with external companies to ensure timely delivery and accurate exchange of information
- Experience in the preliminary and detailed design of complex mechanical systems
- Excellent written and oral communication, and inter-personal skills
- Excellent performance in working as part of a team

Desirable

- Experience in the design of high-pressure systems
- Experience of procurement of high value items
- Experience in managing complex projects
- Experience in a research environment
- User of Solidworks, Autodesk or an equivalent CAD package
- Experience using FEA packages for design purposes
- Experience using data acquisition systems and software, e.g. LabView
- Ability to work independently and as part of a team with good time management skills
- Strong work ethic and close attention to detail

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information, please visit www.ox.ac.uk/about/organisation.

Engineering Science Department

Engineering teaching and research takes place at Oxford in a unified Department of Engineering Science whose academic staff are committed to a common engineering foundation as well as to advanced work in their own specialties, which include most branches of the subject. We have especially strong links with computer science, materials science, medicine and also the Saïd Business School. The Department employs 120 academic staff (this number includes 13 statutory professors appointed in the main branches of the discipline, and 25 full professors); in addition, there are nine visiting professors. There is an experienced team of teaching support staff, professional services and administrative staff and technicians. The Department has well-equipped laboratories and workshops, which together with offices, lecture theatres, library and other facilities have a net floor area of about 25,000 square metres.

The Department is ranked fifth in the world, and the top European University, in the 2023 *Times Higher Education World University Rankings* for Engineering & Technology. Further information about the Department is available at www.eng.ox.ac.uk.

Teaching

We aim to admit 170-180 undergraduates per year to take a 4-year course leading to the MEng degree in Engineering Science. The course is accredited at MEng level by the major engineering institutions. The syllabus has a common core extending through the first two years. Specialist options are introduced in the third year, and the fourth year includes further specialist material and a major project.

Research

Research in the Department is particularly strong. We have approximately 600 research students and about 250 postdoctoral researchers. Direct funding of research grants and contracts, from a variety of sources, amounts to an annual turnover of approximately £70m.

The results of the seven-yearly UK-wide assessment of university research, REF2021, published on 12th May 2022, demonstrate that the University of Oxford made the highest volume of world-leading research submissions. The Department of Engineering Science had 71% of submissions which met the requirements for the highest grading of 4* (research that is world-leading in terms of originality, significance, and rigour).

Research activities fall into 8 broad headings, though there is much overlapping in practice: Information Engineering (Robotics, Computer Vision and Machine Learning); Control; Thermofluids; Materials and Mechanics; Civil and Offshore; Electrical and Optoelectronic; Chemical and Process; and Biomedical.

The Department of Engineering Science holds a bronze Athena Swan award to recognise advancement of gender equality: representation, progression and success for all.

Particles Research at the Oxford Thermofluids Institute

The Oxford Thermofluids Institute (OTI) is part of the University of Oxford's strategic investment in the UK's science base. Situated in Osney Mead, the internationally renowned laboratory conducts world leading research providing aerospace solutions for jet engines and rockets. The research has four strategic flagship themes: Sustainable Aviation, Gas Turbines, Hypersonics and Energy/Environment. The OTI houses the most sophisticated high-speed flow and turbine facilities in the UK. These facilities support development of systems at a high technology readiness level and have wide impact, through deployment in industry, via both research partnerships and commercialisation

About 140 people work within the OTI, with research led by 13 academics, their doctoral and post-doctoral researchers, a staffed machining workshop, research engineers and support staff. The Particle Group at the OTI is lead by Professors David Gillespie and Matthew McGilvray. Research focuses on modelling deposition of ice and non-aqueous particles in jet engines, and validating in house analytical codes with representative experiments <https://oti.eng.ox.ac.uk/>.

The Mathematical, Physical, and Life Sciences Division

The Mathematical, Physical, and Life Sciences (MPLS) Division is one of the four academic divisions of the University. In the results of the six-yearly UK-wide assessment of university research, REF2014, the MPLS division received the highest overall grade point average (GPA) and the highest GPA for outputs. We received the highest proportion of 4* outputs, and the highest proportion of 4* activity overall. More than 50 per cent of MPLS activity was assessed as world leading.

The MPLS Division's 10 departments and 3 interdisciplinary units span the full spectrum of the mathematical, computational, physical, engineering and life sciences, and undertake both fundamental research and cutting-edge applied work. Our research addresses major societal and technological challenges and is increasingly focused on key interdisciplinary issues. MPLS is proud to be the home of some of the most creative and innovative scientific thinkers and leaders working in academe. We have a strong tradition of attracting and nurturing the very best early career researchers who regularly secure prestigious fellowships

We have around 6,000 students and play a major role in training the next generation of leading scientists. Oxford's international reputation for excellence in teaching is reflected in its position at the top of the major league tables and subject assessments.

MPLS is dedicated to bringing the wonder and potential of science to the attention of audiences far beyond the world of academia. We have a strong commitment to supporting public engagement in science through initiatives including the Oxford Sparks portal (<http://www.oxfordsparks.net/>) and a large variety of outreach activities. We also endeavour to bring the potential of our scientific efforts forward for practical and beneficial application to the real world and our desire is to link our best scientific minds with industry and public policy makers.

How to apply

Before submitting an application, you may find it helpful to read the 'Tips on applying for a job at the University of Oxford' document, at www.ox.ac.uk/about/jobs/supportandtechnical/.

If you would like to apply, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a supporting statement. The supporting statement should explain how you meet the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents **as PDF files** with your name and the document type in the filename.

All applications must be received by **midday** on the closing date stated in the online advertisement.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing departments.

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments)

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from [www.ox.ac.uk/about the university/jobs/support/](http://www.ox.ac.uk/about_the_university/jobs/support/). To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. **Please check your spam/junk mail** regularly to ensure that you receive all emails.

Important information for candidates

Pre-employment screening

Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University's pre-employment screening procedures, found at:

www.ox.ac.uk/about/jobs/preemploymentscreening/.

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/. The University's Policy on Data Protection is available at:

www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for all academic posts and some academic-related posts. From 1 October 2017, the University has adopted an EJRA of 30 September before the 69th birthday for all academic and academic-related staff in posts at grade 8 and above. The justification for this is explained at:

www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revaim/.

For **existing** employees, any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revproc/

From 1 October 2017, there is no normal or fixed age at which staff in posts at **grades 1–7** have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of Opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

Benefits of working at the University

University Club and sports facilities

The University Club provides social, sporting and hospitality facilities. It incorporates a bar, café and sporting facilities, including a gym. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See: www.club.ox.ac.uk and www.sport.ox.ac.uk/oxford-university-sports-facilities.

Information for international staff (or those relocating from another part of the UK)

If you are relocating to Oxfordshire from overseas, or elsewhere in the UK, the University's International Staff website includes practical information related to moving to and settling in Oxford such as advice on immigration, relocation, accommodation, or registering with a doctor. See: www.internationalstaffwelcome.admin.ox.ac.uk/

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff to settle into Oxford and to provide them with an opportunity to meet people in the area. See www.newcomers.ox.ac.uk/

Childcare

The University has excellent childcare services with five University nurseries, as well as University-supported places at many other private nurseries. For full details including how to apply and the costs, see www.admin.ox.ac.uk/childcare.

Family-friendly benefits

The University subscribes to My Family Care (www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/) and staff are eligible to register for emergency back-up childcare and adultcare services, a 'speak to an expert' phone line and a wide range of guides and webinars through a website called the Work + Family space.

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. Please visit www.admin.ox.ac.uk/eop/disab/staff for further details including information about how to make contact, in confidence, with the University's Staff Disability Advisor.

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at www.admin.ox.ac.uk/eop/inpractice/networks/

Other benefits

Staff can enjoy a range of other benefits such as free visitor access to the University's colleges and the Botanic Gardens as well as a range of discounts. See www.admin.ox.ac.uk/personnel/staffinfo/benefits