Job Description

ENGINEERING SCIENCE

<table>
<thead>
<tr>
<th>Job title</th>
<th>Senior Research Associate in Impact Engineering</th>
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<tbody>
<tr>
<td>Division</td>
<td>Mathematical, Physical and Life Sciences Division</td>
</tr>
<tr>
<td>Department</td>
<td>Engineering Science</td>
</tr>
<tr>
<td>Location</td>
<td>Impact Engineering Laboratory, Begbroke Science Park</td>
</tr>
<tr>
<td>Grade and salary</td>
<td>Grade 8 £39,992-£47,722</td>
</tr>
<tr>
<td>Hours</td>
<td>Full time</td>
</tr>
<tr>
<td>Contract type</td>
<td>Fixed-term for 3 years</td>
</tr>
<tr>
<td>Reporting to</td>
<td>Prof Nik Petrinic/ Dr Antonio Pellegrino</td>
</tr>
<tr>
<td>Vacancy reference</td>
<td>134362</td>
</tr>
<tr>
<td>Additional information</td>
<td>N/A</td>
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<table>
<thead>
<tr>
<th>Research topic</th>
<th>Integration of Experimental and Modelling Methodologies in Impact Engineering</th>
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<tbody>
<tr>
<td>Principal Investigator / supervisor</td>
<td>Prof Nik Petrinic/Dr Antonio Pelligrino</td>
</tr>
<tr>
<td>Project team</td>
<td>Impact Engineering Team</td>
</tr>
<tr>
<td>Project web site</td>
<td><a href="http://www.ox.ac.uk./iel/IEET.html">www.ox.ac.uk./iel/IEET.html</a></td>
</tr>
<tr>
<td>Funding partner</td>
<td>The funds supporting this research project are provided by Rolls-Royce</td>
</tr>
<tr>
<td>Recent publications</td>
<td></td>
</tr>
</tbody>
</table>

The role

Oxford’s Impact Engineering Team is well known for its ability to design and build bespoke experiments aimed at observation and quantification of pressure, temperature and rate dependent deformation and failure mechanisms in naturally occurring and man-made materials, as well as to develop analytical and numerical methodology (software) to simulate the experimentally observed and quantified behaviour of materials, systems and structures. This job opportunity has arisen as a result of the desire to strengthen the research in impact engineering arising from an increasing demand for development of new methodologies for
characterisation and modelling of pressure, temperature and strain rate dependent behaviour of materials subjected to impact loading, which is of great interest to industry and government agencies.

The post-holder will engage in advanced study and academic research, and will contribute to the teaching, research, and academic administration of the Department. Reporting to the Principal Investigator, the post-holder will help ensure a healthy and vibrant research environment within Impact Engineering. This will involve leading, devising, coordinating and supervising research projects in this area, including work in collaboration with project partners, guidance to researchers and students, and winning further funding to underpin the research. The post-holder will also be involved in the administrative activities of the Group and Department and will be responsible for overseeing and managing a range of research and trading projects and ensuring that results and reports are delivered on time and within budget.

**Responsibilities**

- Develop research questions within impact engineering, conduct individual research, analysing detailed and complex qualitative and/or quantitative data from a variety of sources, and generate original ideas by building on existing concepts
- Manage, and execute numerous research and industry funded research projects focused on the mechanical behaviour of engineering materials subjected to impulsive loading and extreme strain rate and temperature conditions
- Carry out collaborative projects with colleagues in industry, partner institutions and research groups
- Conduct state of the art experiments for the characterisation of the temperature and strain rate dependent mechanical behaviour of engineering materials
- Agree clear task objectives, organise, and delegate work to other members of the team and coach other members of the group on specialist methodologies or procedures
- Translate testing requirements into the design of standard and bespoke fixtures for experiments to be conducted at quasi static, medium and high rate of strain.
- Liaise with funding bodies and provide information to project stakeholders and represent the research group at external meetings/seminars
- Develop and implement protocols and analytical techniques to support research in experimental mechanics
- Design experiments and develop bespoke designed equipment
- Promote and contribute continuously to the improvement of the experimental capabilities in Impact Engineering
- Produce safe operating procedures, working instructions and risk assessments for a wide range of equipment
- Regularly write reports for research sponsors and papers for publication in academic peer-reviewed journals, books and conference proceedings.
• Raise funds for research and trading projects and manage own area of a larger research budget

• Share responsibility for shaping the research group’s technology transfer plans and the writing of group-funding applications.

• Member of departmental committees advising on scientific and management matters for the department

• The RA may have the opportunity to teach or undertake ad-hoc paid teaching (this includes lecturing, demonstrating, small-group teaching, tutoring of undergraduates and graduate students and supervision of masters projects in collaboration with principal investigators). Permission must be sought in advance for each opportunity and the total must not exceed 4 hours a week.

Selection criteria

Essential

• Hold a relevant Ph.D/D.Phil with post-qualification research experience

• Possess demonstrable knowledge and research experience in experimental characterisation of pressure, temperature and rate dependent behaviour of materials for advanced engineering applications (Hopkinson Bar, gas guns, Taylor impact etc.).

• Comprehensive knowledge of the field of materials in extreme dynamic environment in aerospace and defence sectors

• Experience in liaising with funding bodies and providing information and writing reports for project stakeholders.

• Experience in research laboratory management. Ability to independently plan and manage knowledge transfer and research projects, including a research budget

• Experience in presenting engineering results and concepts to a wide audience during conferences, workshops, meetings and seminars

• Ability to design and develop bespoke specialized experimental equipment

• Expertise in high speed and ultra-high speed image and data acquisition systems.

• Strong Interpersonal skills (ability to work in team and build collaborative relationships with external funding bodies)

Desirable

• Experience in Project Management
• Strong publication record and familiarity with the existing literature and research in the field of dynamic behaviour of materials subjected to rapidly applied loading.

• Experience of supervising and mentoring staff and junior researchers including undergraduate and postgraduate students.

• Knowledge of IP and patent application drafting

• Ability to work under pressure in order to respect tight deadlines

• Experience of writing proposals for research and/or trading projects

• Experience in the use of CAD packages (such as AutoCAD) and solid modelling packages (such as Solid Works, Solid Edge, Pro Engineer, Catia)

• Ability to develop experimental capability using LabView software

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, and in providing all of our staff with a welcoming and inclusive workplace that supports everyone to develop and do their best work. Recognising that diversity is a great strength, and 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. Income from external research contracts in 2014/15 exceeded £522.9m and ranked first in the UK for university spin-outs, with more than 130 spin-off companies created to date. 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 specialities, which include most branches of the subject. We have especially strong links with computing, materials science and medicine. The Department employs about 90 academic staff (this number includes 13 statutory Professors appointed in the main branches of the discipline, and 25 other professors in the Department); in addition there are 9
Visiting Professors. There is an experienced team of teaching support staff, clerical 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 22,000 square metres. The Department is ranked third in the world in the latest Times Higher Education World University Rankings, behind Caltech and Stanford, but ahead of MIT (4th), Cambridge (5th), Princeton (6th) and Imperial (7th).

Teaching

We aim to admit 160-170 undergraduates per year, all of whom take a 4-year Engineering Science course leading to the MEng degree. 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

The Department was ranked the top engineering department in the UK, as measured by overall GPA, in the Research Excellence Framework 2014 exercise. We have approximately 350 research students and about 130 Research Fellows and Postdoctoral researchers. Direct funding of research grants and contracts, from a variety of sources, amounts to an annual turnover of approximately £19m in addition to general turnover of about £18m. The research activities of the department fall into seven broad headings, though there is much overlapping in practice: Thermofluids; Materials and Mechanics; Civil and Offshore; Information, Control and Vision; Electrical and Optoelectronic; Chemical and Process; Biomedical Engineering.

For more information please visit: http://www.eng.ox.ac.uk/

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

The Solid Mechanics and Materials Engineering Group

The Solid Mechanics and Materials Engineering Group is one of the largest research groups within the department. It includes thirteen members of academic staff: Professors Alan Cocks, David Hills, Alexander Korsunsky, Nik Petrinic and Roger Reed, Associate Professors John Huber, Clive Siviour, Jin-Chong Tan, Antoine Jerusalem, Felix Hoffman and Dan Eakins and two Departmental Lecturers, Drs Alice Cicerello and Antonio Pellegrino. Professor Cocks holds the Chair of Materials Engineering and acts as head of the group. The group contains the Rolls-Royce UTC in Solid Mechanics under the Directorship of Professor Hills. The total turnover of the group is in excess of £4m per annum. Our research activities are supported by seven technicians, five administrators and a computing support officer. These people, together with the academic staff, form the core of the group's personnel. In addition, there are about forty research students, research assistants, post-doctoral assistants and academic visitors, most of whom have a typical association of three to five years.

The group has strong links with industry, particularly in the energy and aerospace sectors. Much of the aerospace related research takes place in the Rolls-Royce funded UTC in Solid Mechanics. The UTC was established in 1990 with the aim of undertaking strategic and applied research relevant to Rolls-Royce's technology base (power systems providing power for land, sea and air). The UTC receives annual infrastructure funding from the company in addition to support for a number of specific projects, with a current focus on structural integrity. The performance of materials and structures under dynamic and quasi-static loading conditions, including multiaxial stress states and high stress gradients, has been extensively studied within the UTC. Recent work has been in the areas of contact mechanics, fretting fatigue and impact, with an extensive range of testing machines in the Department available to provide model
validation. Other work focuses on residual stress at the micro- and macro-scale and on how this affects fatigue performance.

The group also has extensive research activities related to the defence and energy sectors and are further developing their research interests in power generation through collaborations with EDF Energy, Siemens and Mitsubishi Heavy Industries. Collaborations and research projects with healthcare and other industrial sectors exist, which allow the group to maintain a balanced and progressive portfolio of research projects. (http://www.eng.ox.ac.uk/solidmech/home/Home.html).

The Impact Engineering Team

The Impact Engineering Team is the largest segment of the wider Solid Mechanics and Materials Engineering Group and operates within the Impact Engineering Laboratory at the University of Oxford Begbroke Science Park. The research team, led by Professor Nik Petrinic, comprises several postdoctoral researchers and a dozen postgraduate students, supported by technical, IT and administration staff. A main objective of the research is to observe and quantify rate dependent behaviour of naturally occurring and man-made materials and to develop multi-scale predictive models that allow observations made in the laboratory to be extended and applied to practical design scenarios. Further details of the team’s research activities may be found on the team website (http://www.eng.ox.ac.uk/iel/IET.html).

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.

For more information about the MPLS division, please visit: http://www.mpls.ox.ac.uk/
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.

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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/. 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/.

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/

Form 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