Imperial College London

Department of Mechanical Engineering

Academic Post in Fluid Mechanics, in the Thermofluids Division of the Department of Mechanical Engineering

An appointment to be made at the Reader or Chair (Professor) level according to experience.

FURTHER PARTICULARS

1. The College

Imperial College London consistently achieves one of the highest rankings nationally and internationally, as listed in the Times Higher QS World University Rankings 2012-2013.

The President (formally known as the President & Rector), Professor Alice P. Gast, is the College's academic head and chief executive officer, overseeing all functions of the College, and focusing on the College's strategic affairs and development.

The Provost, Professor James Stirling, is responsible for delivering and enhancing the College's academic mission in education, research and translation, and reports to the President.

The Mission

Imperial College embodies and delivers world class scholarship, education and research in science, engineering and medicine, with particular regard to their application in industry, commerce and healthcare. We foster interdisciplinary working within the College, and collaborate widely externally.

Strategic Intent

The College's vision and intent is to:

Continue to be a world-leading institution for scientific research and education,

To harness the quality, breadth and depth of our research capabilities to address the difficult challenges of today and the future,

To develop the next generation of researchers, scientists and academics,

To provide an education for students from around the world that equips them with the knowledge and skills they require to pursue their ambitions,

To make a demonstrable economic and social impact through the translation of our work into practice worldwide,

To engage with the world and communicate the importance and benefits of science to society.

Formation and History

Imperial College was established in 1907 in London's scientific and cultural heartland in South Kensington, as a merger of the Royal College of Science, the City and Guilds College and the Royal School of Mines. St Mary's Hospital Medical School and the National Heart and Lung Institute merged with the College in 1988 and 1995 respectively.

Charing Cross and Westminster Medical School and the Royal Postgraduate Medical School merged with the College on 1 August 1997 to form, with the existing departments on the St Mary's and Royal Brompton campuses, the Faculty of Medicine.

The Kennedy Institute of Rheumatology joined the Faculty of Medicine in 2000 and for over a decade was unique in Europe for its integration of basic science research and clinical facilities in rheumatology. On 1 August 2011, the Institute moved to Oxford University to build a new centre for research into rheumatology and inflammatory and autoimmune disease.

In 2007, the Imperial College Healthcare NHS Trust, was formed by merging Hammersmith and St Mary's Hospitals' NHS Trusts with the College, forming the country's largest NHS Trust. This also established the UK's first Academic Health Science Centre (AHSC) bringing together healthcare services, teaching and research for maximum synergistic benefits.

Imperial College was an independent constituent part of the University of London until July 2007, when it was granted a new royal charter declaring it an independent university in its own right.

The academic structure of Imperial College is divided into three faculties, the Faculties of Engineering, Natural Sciences and Medicine. The College's other major academic unit is the Business School.

Staff and Students

The academic and research staff of 3,456 includes 72 Fellows of the Royal Society, 84 Fellows of the Royal Academy of Engineering, 79 Fellows of the Academy of Medical Sciences, one Fellow of the British Academy, four Crafoord Prize winners and two Fields Medalists. Fourteen Nobel Laureates have been members of the College either as staff or students.

The College has 14,414 students, of whom 39 percent are postgraduate. Thirty one percent of students come from outside the European Union. External assessment of the College's teaching quality in many different subject areas has been judged to be of high standard. The proportion of women students has increased to 36 percent of the total.

Research and Translation

The quality of the College's research has been judged consistently to be of the highest international standard and the proportion of income from research grants and contracts is one of the highest of any UK university.

The concentration and strength of research in science, engineering and medicine gives the College a unique and internationally distinctive research presence. Interdisciplinary institutes at the College provide a focal point to harness research that seeks solutions to grand challenges, such as improving global health, tackling climate change, finding sustainable sources of energy and addressing security challenges.

International collaborations provide further opportunities, such as the Imperial College London Diabetes Centre in Abu Dhabi, the largest specialist medical centre in the United Arab Emirates. Biobank Qatar is another example of international collaboration, established by the Qatar Foundation and Qatar's Supreme Council of Health and led by Imperial's School of Public Health, to conduct the largest population-based study in an Arab country and to address a variety of chronic diseases ranging from heart disease to diabetes.

Generous support for the College's work comes from a wide variety of sources. From industry there are donations towards certain senior academic posts, advanced courses, bursaries and scholarships. The single largest contribution to the College from industrial concerns is in the form of contracts to carry out research. The College also gains considerable support from research councils and charities to undertake research.

Teaching and Learning

The College's overall educational aim is to ensure a stretching and exhilarating learning experience and, while maintaining its traditional emphasis on single honours degree courses, it also aims to give students the opportunity to broaden their experience through courses relevant to student and employer needs.

In its MSc. course provision, the College seeks to provide a wide range of specialist courses in areas in which it has particular expertise. Many of those offered by non-medical departments emphasise the valuable interaction between scientific/technological training and industrial experience, whilst those offered by the medical departments focus on subjects at the interface between basic science and medicine and on specialist education for doctors and other health professionals in training. In addition, the College's wide range of PhD programmes reflect its aim of pursuing research at the frontiers of scientific, engineering, management and medical knowledge and the increasingly interdisciplinary nature of this research.

The Centre for Educational Development raises and consolidates the profile of learning, teaching and educational development throughout the College. Newly-appointed non-clinical lecturers will be expected to develop and expand their teaching skills, and there are many learning and teaching activities for more experienced staff.

The Graduate School is the focus of postgraduate education and research and maintains, enhances and monitors quality, disseminates best practice, while initiating and developing new programmes, particularly those with an interdisciplinary slant. It also has quality assurance responsibilities for the two non-faculty departments of Humanities and the Business School.

The College's teaching quality is audited regularly, both internally and externally. Recent external audit found teaching quality to be of a high standard.

The College continually seeks to engage with, and form ventures with other organisations to take advantage of research opportunities and synergies, as well as expanding its influence in education. In August 2013 the Lee Kong Chian School of Medicine (LKCMedicine), a joint initiative between the College and Nanyang Technological University (NTU) in Singapore, opened its doors to its inaugural cohort of 54 students. At full capacity, it is expected that there will be 750 students studying for medical degrees. The students will pursue an innovative curriculum developed by a team in the Faculty of Medicine at Imperial, leading to a Bachelor of Medicine and Bachelor of Surgery (MBBS) jointly between Imperial and NTU.

Location

The College now has one of the largest operational estates of any UK University. It includes six central London campuses, the main South Kensington campus, the Charring Cross campus, the Chelsea and Westminster campus, the Hammersmith campus, the Royal Brompton campus and St Mary's campus.

A new campus, Imperial West, at White City, in London, is under development. Adjacent to Imperial's Hammersmith Medical Campus, it will be at the heart of London's new research quarter. It will provide a multidisciplinary research space for Imperial scientists and engineers to tackle some of the global challenges faced today, together with state-of-the-art space for translating research ideas into direct applications and spin-out companies. The first buildings opened in September 2012 and provide accommodation to over 600 postgraduate students. The next phase of the development will see the realisation of the vision for the Research and Translation Hub.

Silwood Park is a postgraduate campus at Ascot in Berkshire, and houses ecologists and evolutionary biologists from the Department of Life Sciences, as well as the new initiative in

Grand Challenges in Ecosystems and the Environment. Some Master's courses are run at Silwood Park, while others are based at the Natural History Museum in London. The Silwood Park campus houses excellent research facilities and a wide range of natural environments for long-term experiments.

2. The Faculty of Engineering

The Faculty of Engineering is one of three faculties within Imperial College London and is led by the Dean, Professor Jeff Magee FREng. The Faculty seeks to provide international leadership in engineering research and education and is widely recognised as a world-leading engineering school. In the Times Higher Education World University Rankings 2014-2015 the Faculty was ranked 2nd in Europe and 6th in the world for Engineering and Information Technology. Our Faculty is unique in the UK in supporting world-class education and fundamental research across the full range of engineering disciplines. All ten of our academic departments are located on a single campus in South Kensington, giving a concentration of talent that creates a stimulating and vibrant research culture which promotes multidisciplinary collaborations and attracts internationally leading researchers and scholars.

Our academic departments deliver world-class education in engineering in order that our graduates possess the skills, knowledge and attitudes necessary to become international leaders in engineering industry and academia. We provide our students with an outstanding engineering education, that brings together cutting edge researchers, exceptional teachers and state-of-the-art facilities in inspiring physical and virtual environments. Students at Imperial will meet, work and live with people studying every aspect of engineering.

The Faculty is home to 1,575 staff (395 academics, over 800 researchers and 365 support staff) and 5,785 students (of whom 1,200 are research students). The Faculty is a powerhouse in research across the engineering sciences, with research funding in excess of £100M per annum.

Please see the Faculty of Engineering web pages for further information:

http://www.imperial.ac.uk/engineering

3. The Department of Mechanical Engineering

The department has over 45 academic staff, about 60 research staff and approximately 120 research students registered for a MPhil or PhD degree. The department receives over £6 million per annum in sponsor funded research grants and there is close collaboration with major UK and international companies such as Rolls-Royce, National Power, Shell, BP Chemicals, Honda and British Gas.

The department is organised into three Research Divisions that are predominantly based on shared resources and research interests: **Mechanics of Materials**: adhesives, composites and polymers, food technology, materials modelling and nano-materials; **Thermofluids**: sustainable energy technologies, and multi-scale flow dynamics; and **Applied Mechanics**: medical engineering, nuclear engineering, dynamics, design engineering, non-destructive testing, railway engineering and tribology.

The position advertised will be in the Thermofluids Division, led by Professor Ricardo Martinez-Botas. This division currently has 15 academic members and provides a supportive and well-equipped environment for research. The successful candidate will join the Thermofluids Division in the Department of Mechanical Engineering with a view to lead research in their areas of expertise. The division has an internationally leading record in pure and applied research into combustion, heat and mass transfer and fluid flow. Extensive experimental laboratories have recently refurbished and it hosts a large range of laser sources and detectors, the recent investment in both equipment and laboratories is in the order of £15M. Our research is undertaken using advanced optical instruments and

computational flow modelling methods (CFD). The ability of the division to undertake combined experimental and computational modelling studies at a fundamental level is an important aspect of the division's capabilities.

Mechanical Engineering offers a four year undergraduate course, which leads to the MEng degree and to the Diploma of the Associateship of the City and Guilds Institute (ACGI). There are currently over 500 students registered for this course.

The department also offers two taught courses for postgraduate study: a one year MSc in Advanced Mechanical Engineering and a two year MA Course in Industrial Design Engineering run jointly by the department and the Royal College of Art.

Please see the Department of Mechanical Engineering web pages for further information: http://www3.imperial.ac.uk/mechanicalengineering

4. **Job Title: Reader/Chair in Fluid Mechanics, in the Thermofluids Division of the Department of Mechanical Engineering**

Reporting to: The Head of the Department of Mechanical Engineering

Key Responsibilities:

Research

The appointees will be expected to plan and direct the implementation of research activities and programmes of outstanding quality, international repute and innovation in Thermofluids.

Candidates should preferably have expertise in the development of advanced laser diagnostic techniques and their application to complex single or multi-phase turbulent flows with or without reaction, such as those occurring in IC engines or gas turbines. However, outstanding candidates in other areas of experimental fluid mechanics will also be considered.

And in addition for candidates must demonstrate

- An ability to develop interdisciplinary links both in teaching and research with other departments and centres in the Faculty and the College
- An ability to attract substantial research funds
- An ability to maintain the highest standards of research governance and ethics
- An ability to contribute where applicable to the planning of development in research and teaching

Teaching

The postholder will be expected to be capable of contributing to the department's undergraduate and Master's course teaching across a wide spectrum of its lecture courses. The postholder will teach and examine courses to all levels including undergraduate, master's and higher research degree students through lectures, seminars, course work, tutorials and personal supervision. The postholder will be required to prepare and deliver lectures to classes. In addition, because the department's teaching places great emphasis on project-based design and laboratory work, the postholder will be involved in the supervision of laboratory and/or design groups. All Lecturers in the department are required to attend training courses in teaching methods and course design, unless they can demonstrate existing qualifications. The appointee will be required to

- plan and review his or her own approach to teaching;
- contribute to the development of teaching, teaching methods and assessments in the department to enhance the quality of teaching; develop approaches to teaching which are innovative and reflect best practice developing elsewhere;

- develop course proposals and contribute to curriculum development;
- supervise research projects at both undergraduate and master's levels

Administration

- Contribute to the administration of the department, where appropriate
- Be involved in the pastoral care of students
- Assist with the development and effective use of budgets as part of grant management

To observe and comply with all College policies and regulations, including the key policies and procedures on Confidentiality, Conflict of Interest, Data Protection, Equal Opportunities, Financial Regulations, Health and Safety, Imperial Expectations (for new leaders, managers and supervisors), Information Technology, Private Engagements and Register of Interests, and Smoking.

To undertake specific safety responsibilities relevant to individual roles, as set out on the College Website Health and Safety Structure and Responsibilities page (http://www3.imperial.ac.uk/safety/policies/organisationandarrangements).

Job descriptions cannot be exhaustive and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to eliminating discrimination. All employees are expected to adhere to the principles set out in its Equal Opportunities in Employment Policy, Promoting Race Equality Policy and all other relevant guidance/practice frameworks.

PERSON SPECIFICATION

The successful candidate for the post should have/be able to demonstrate the following:

Imperial Expectations

These are the 7 principles that Imperial leaders, managers and supervisors are expected to follow:

1) Champion a positive approach to change and opportunity
2) Communicate regularly and effectively within, and across, teams
3) Consider the thoughts and expectations of others
4) Deliver positive outcomes
5) Encourage inclusive participation and eliminate discrimination
6) Support and develop staff to optimise talent
7) Work in a planned and managed way

Knowledge, Skills and Experience

Candidates should have expertise in the development of advanced (e.g. laser based) experimental techniques and their application to fluid processes of relevance to areas such as energy efficiency, thermal energy recovery or engine downsizing that show significant potential for CO_2 reduction. However, outstanding candidates in other areas of experimental fluid mechanics will also be considered.

And in addition applicants must have

- Experience within subject specialism, supported by relevant qualification (PhD or equivalent) and optional teaching qualification.
- High level of analytical capability
- Excellent interpersonal skills
- Candidates should also be able to manage a research team.

- A good track record of working with industrial partners is a distinct advantage.
- An outstanding research record as demonstrated by publications
- Ability to communicate with, and inspire, students
- The appointees will be expected to plan and direct the implementation of research activities and programmes of outstanding quality, international repute and innovation.

Qualifications

- A doctoral degree (or equivalent) in a relevant field.
- A strong background and education in thermal sciences and/or fluid mechanics

Research

Evidence of:

- presentation of research findings at national and international meetings of specialist learned societies
- substantial quality and quantity of research output
- effective collaborative work at national and international level
- potential to plan, lead and direct research activity of outstanding quality
- potential to achieve national and international eminence in chosen field

Leadership/management

Evidence of successful management at group/departmental level in

- grant management, budget setting
- recruitment and selection of staff, appraisal and setting performance reviews
- contribution to broader management processes
- managing change successfully, making effective decisions and problem solving

For Chair (Professor) appointment, in addition to the above, the candidates will be able to demonstrate a sustained international reputation based on an extensive track record of research with a major influence on their research and a significant impact shown, for example, through consistent influence on research income.

5. Salary and Conditions of Service

A full set of terms and conditions will be given to the successful candidate, together with the College's most important policies which affect staff. The principal terms and conditions are as follow:

Readers
The minimum salary for a Reader is £56,450 per annum (effective from 1 August 2014 until further notice, for London and Silwood Park).

The post will be graded at Level D in the Academic and Research Job Family.
Enhancements to pay will be based on individual performance. Annual cost of living increases will be determined by Imperial College through its local collective bargaining machinery.

Professors
The minimum salary for a Professor is £71,760 per annum (effective from 1 August 2014 until further notice, for London and Silwood Park).

The post will be graded at Level E in the Academic and Research Job Family. Any salary increases or performance payments will be determined in accordance with procedures which govern senior academic staff. Annual cost of living increases will be determined by Imperial College through its local collective bargaining machinery.

Salaries are payable on the 24th day of each month (the exception being December) by transfer to a bank or building society account. Deductions in respect of income tax and National Insurance contributions will be made from salaries at the statutory rates.

Academic staff normally take annual leave during College vacations and by arrangement with the Head of Department in the light of academic and departmental requirements. Annual leave entitlement is 39 days for full time staff (pro rata entitlement for part time staff). This is inclusive of 8 days for Public holidays and a total of six days each year when the College is closed over Easter and Christmas.

In some years, because of the day of the week on which Christmas Day falls, a decision may be made to increase the College closure to seven days. In these circumstances the annual leave entitlement will be increased to 40 days for full-time staff (again pro-rata for part-time staff).

At the beginning of the leave year staff will be required to allocate the appropriate number of days of their mandatory leave entitlement to cover the College Closure days and Public holidays that fall within that leave year. For part-time staff the allocation should cover their normal working days that fall upon a College closure day, bank or public holiday during that leave year.

The College Closure days and Public Holidays are listed on the HR website.

The occupational pension scheme is the Universities Superannuation Scheme (USS). Staff who are already members of the Federated Superannuation System for Universities (FSSU) or the National Health Service Superannuation Scheme (NHSPS) may, if they are still eligible, retain their membership in these schemes.

Unless stated otherwise in the offer of employment, or agreed by the Head of Department, the appointment may be terminated by either side by giving a minimum of three months' notice in writing. The last day of service should fall on one of the following dates: 31 December; 31 March; 30 June or 30 September or at the end of a term by agreement with the head of department.

All appointments have a probationary period of six months, or, in the case Lecturers and Senior Lecturers (clinical or non clinical), a training and development review period, which lasts 3 years.

6. Applications

Our preferred method of application is online via our website at the following link: http://www3.imperial.ac.uk/employment (select "Job Search"). Please complete and upload an application form as directed and submit any other relevant supporting documents. **(PLEASE NOTE YOU MUST SUBMIT AN APPLICATION FORM, NOT JUST A CV, IF YOU DO NOT FILL IN AN APPLICATION FORM, YOUR APPLICATION WILL NOT BE CONSIDERED).**

Applicants' CV should include the following information:

a) Applicant's full name, confidential e-mail address, private address and telephone number
c) Degrees (including Universities and dates)
d) Past and present posts
e) List of publications (if not included in your CV)
f) Brief description of current and future research plans
g) A brief statement of your teaching interests
g) Information on research grants and contracts which have been obtained, student supervision, etc.
h) Information regarding public engagement undertaken with research activities. Examples include: participating in festivals, working with cultural venues; creating opportunities for the public to inform research; researchers and the public working together to inform policy; citizen researchers and web based experiments, public debates, etc.

If candidates choose to e-mail their application, a hard copy of the application with an original signature on it will also need to be mailed, together with the recruitment monitoring form, and the CV to:

Maria Monteiro
Senior Appointments Coordinator (Professors and Readers)
Human Resources Division
Level 3, Faculty Building
Imperial College London
London SW7 2AZ
email m.monteiro@imperial.ac.uk
Telephone: +44 (0)207 594 5498

Closing date: 27 March 2015

Interview date to be confirmed - (provisionally from mid-May to end of June 2015)

Envelopes should be marked "Appointment Reader or Chair in Fluid Mechanics EN20150030SC"

All candidates will be contacted after the shortlist is completed.