



Trinity College Dublin

Coláiste na Tríonóide, Baile Átha Cliath

The University of Dublin

Post Specification

Post Title:	Research Fellow in Engineering (Two-phase Flow Modelling and Optimisation)
Post Status:	Specific Purpose Contract (up to 24 months) Full-time
Location:	Dept. Mechanical, Manufacturing & Biomedical Engineering, Parsons Building, the University of Dublin, Trinity College Dublin, Dublin 2, Ireland
Reports to:	Asst. Prof. Dr. Michael Gibbons (Principal Investigator)
Salary:	Appointment will be made on the IUA Postdoctoral Researcher Scale at a point in line with Government Pay Policy [€41,208 - €43,699 per annum], appointment will be made no higher than point 3 - PD1 (€43,699).
Hours of Work:	37.5 hours per week (9:00 – 17:00, Mon - Fri.)
Closing Date and Time:	16 th June 2023 or until the position is filled.
Anticipated Start Date:	July-Aug 2023
Please note that ONLY shortlisted candidates will be contacted by email.	

Post Summary

The Thermal Fluids and Energy research group at the University of Dublin, Trinity College, is seeking to recruit a postdoctoral researcher on computational modelling, design and optimisation of two-phase flow through porous structures. The analysis methods will include computational fluid dynamics modelling, numerical shape and/or topology optimisation, which could be implemented in commercial software packages such as ANSYS Fluent, OpenFOAM and/or additional CFD or optimisation packages, as well as custom-developed code.

This research aims to investigate flow through porous structures. Porous structures are ubiquitous in heat transfer and passive fluid transport applications. Traditional porous structures are monoporous in design. However, recent research has focused on hybrid structures to optimise capillary pressure and permeability.

The objectives of this project are:

- (i) Development of a two-phase numerical model for capillary flow through porous structures.
- (ii) Shape/topology optimisation of the porous structure accounting for real-world porous structure manufacturing/fabrication techniques.
- (iii) Fabrication and characterisation of optimised porous structures.

This work is part of a larger project developing loop heat pipe technology for waste heat recovery in data centres as part of an ongoing Royal Society-Science Foundation Ireland-funded project.

Standard Duties and Responsibilities of the Post

- Lead the two-phase flow modelling and optimisation through porous structures research project to complete the outlined objectives.
- Undertake appropriate administrative/management/leadership activities and tasks.
- Mentor and supervise undergraduate and/or graduate students and provide training in relevant research methods.

- Publish peer-reviewed articles and present findings at national/international scientific meetings.
- Collaborate with other researchers in the Fluids and Heat Transfer Lab working in two-phase flow and heat transfer, and develop future funding proposals.

Funding Information

24-month project through the Royal Society (<https://royalsociety.org/>) and Science Foundation Ireland (<https://www.sfi.ie/>).

Person Specification

Qualifications

- PhD in Mechanical Engineering or related discipline. [Essential]

Knowledge & Experience (Essential & Desirable)

The successful candidate will be expected to clearly demonstrate the following:

- Strong background in numerical thermal design and fluid dynamics research. This experience should be proven by a record of high-impact research outputs (e.g., publications in respected journals and conferences, patents, or any other relevant experience). [Essential]
- Fundamental knowledge of numerical simulation of two-phase transport, thermal-fluid sciences, heat transfer and phase change phenomena. [Essential]
- Experience in material science, additive manufacturing and fabrication of porous structures. [Desirable]

Skills & Competencies

- Strong written, verbal and interpersonal communication skills to produce appropriately presented information.
- Project management and organisational skills, particularly coordinating research project timelines, admin and researchers.
- Flexible, self-motivated; ability to work independently and collaboratively.
- Capability and confidence to take ownership of problems and seek long-term solutions.

- Enthusiastic, motivated and committed to personal development.

Application Procedure

Applicants should submit (pdf or Word):

- Cover letter.
- Full curriculum vitae to include a list of publications and the names and contact details of three referees (including email addresses).

Name: Dr. Michael Gibbons

Title: Assistant Professor in Advanced Heat Transfer

Email Address: Michael.Gibbons@tcd.ie

Please include “TFE_RF_01” at the start of the subject line of the email application.

Should you be shortlisted for the post, your referees may be contacted.

Please note that ONLY shortlisted candidates will be contacted by email.

Further Information for Applicants

URL Link to Area:	https://www.tcd.ie/
URL Link to Department:	https://www.tcd.ie/mecheng/
URL Link to PI’s Research Group:	https://www.gibbonslab.com/
URL Link to Human Resources	https://www.tcd.ie/hr/

Trinity College Dublin, the University of Dublin

Trinity is Ireland's leading university and is ranked 98th in the world (QS World University Rankings 2023). Founded in 1592, the University is steeped in history with a reputation for excellence in education, research and innovation.

Located on an iconic campus in the heart of Dublin's city centre, Trinity has 18,000 undergraduate and postgraduate students across our three faculties – Arts, Humanities, and Social Sciences; Engineering, Mathematics and Science; and Health Sciences.

Trinity is ranked as the 16th most international university in the world (Times Higher Education Rankings 2023) and has students and staff from over 120 countries.

The pursuit of excellence through research and scholarship is at the heart of a Trinity education, and our researchers have an outstanding publication record and strong record of grant success. Trinity has developed 19 broad-based multidisciplinary research themes that cut across disciplines and facilitate world-leading research and collaboration within the University and with colleagues around the world. Trinity is also home to 5 leading flagship research institutes:

- Trinity Biomedical Sciences Institute (TBSI)
- Trinity College Institute of Neuroscience (TCIN)
- Trinity Translational Medical Institute (TTMI)
- Trinity Long Room Hub Arts and Humanities Research Institute (TLRH)
- Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN)

Trinity is 1st in Europe for Producing Entrepreneurs for the 7th year in a row and Europe's only representative in the world's top-50 universities (Pitchbook 2021-2022).

Trinity is home to the famous Old Library and to the historic Book of Kells as well as other internationally significant holdings in manuscripts, maps and early printed material. The Trinity Library is a legal deposit library, granting the University the right to claim a copy of

every book published in Ireland and the UK. At present, the Library's holdings span approximately 6.5 million printed items, 400,000 e-books and 150,000 e-journals.

With over 120,000 alumni, Trinity's tradition of independent intellectual inquiry has produced some of the world's finest, most original minds including the writers Oscar Wilde and Samuel Beckett (Nobel laureates), the mathematician William Rowan Hamilton and the physicist Ernest Walton (Nobel laureate), the political thinker Edmund Burke, and the former President of Ireland Mary Robinson. This tradition finds expression today in a campus culture of scholarship, innovation, creativity, entrepreneurship and dedication to societal reform.

Rankings

Trinity College Dublin is the top ranked university in Ireland. Using the QS methodology we are ranked 98th in the world and using the Times Higher Education World University Ranking methodology we are 146th in the World.

- Trinity College Dublin is Ireland's No.1 University
(QS World University Ranking 2023, Times Higher Education Rankings 2022)
- Trinity is ranked 98th in the World
(QS World University Ranking 2023)
- Trinity is ranked No.1 in Europe for Producing Entrepreneurs for the 7th year in a row
Pitchbook 2021-2022

Full details are available at: www.tcd.ie/research/about/rankings.

The Selection Process in Trinity

Given the degree of co-ordination and planning to have a Selection Committee available on the specified date, the University regrets that it may not be in a position to offer alternate selection dates. Where candidates are unavailable, reserves may be drawn from a shortlist. Outcomes of interviews are notified in writing to candidates and are issued no later than 5 working days following the selection day.

In some instances the Selection Committee may avail of telephone or video conferencing. The University's selection methods may consist of any or all of the following: Interviews, Presentations, Psychometric Testing, References and Situational Exercises.

It is the policy of the University to conduct pre-employment medical screening/full pre-employment medicals. Information supplied by candidates in their application (Cover Letter and CV) will be used to shortlist for interview.

Applications from non-EEA citizens are welcomed. However, eligibility is determined by the Department of Business, Enterprise and Innovation and further information on the Highly Skills Eligible Occupations List is set out in Schedule 3 of the Regulations

<https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/Employment-Permits/Employment-Permit-Eligibility/Highly-Skilled-Eligible-Occupations-List/> and the

Ineligible Categories of Employment are set out in Schedule 4 of the Regulations

<https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/Employment-Permits/Employment-Permit-Eligibility/Ineligible-Categories-of-Employment/> . Non-EEA

candidates should note that the onus is on them to secure a visa to travel to Ireland prior to interview. Non-EEA candidates should also be aware that even if successful at interview, an appointment to the post is contingent on the securing of an employment permit.

Equal Opportunities Policy

Trinity is an equal opportunities employer and is committed to employment policies, procedures and practices which do not discriminate on grounds such as gender, civil status, family status, age, disability, race, religious belief, sexual orientation or membership of the travelling community. On that basis we encourage and welcome talented people from all backgrounds to join our staff community. Trinity's Diversity Statement can be viewed in full at <https://www.tcd.ie/diversity-inclusion/diversity-statement>.

Pension Entitlements

This is a pensionable position and the provisions of the Public Service Superannuation (Miscellaneous Provisions) Act 2004 will apply in relation to retirement age for pension purposes. Details of the relevant Pension Scheme will be provided to the successful applicant.

Applicants should note that they will be required to complete a Pre-Employment Declaration to confirm whether or not they have previously availed of an Irish Public Service Scheme of incentivised early retirement or enhanced redundancy payment. Applicants will also be required to declare any entitlements to a Public Service pension benefit (in payment or preserved) from any other Irish Public Service employment.

Applicants formerly employed by the Irish Public Service that may previously have availed of an Irish Public Service Scheme of Incentivised early retirement or enhanced redundancy payment should ensure that they are not precluded from re-engagement in the Irish Public Service under the terms of such Schemes. Such queries should be directed to an applicant's former Irish Public Service Employer in the first instance.

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