

Post Specification

Post Title:	Research Fellow (Postdoctoral Researcher) / Research Assistant
Post Status:	Specific Purpose Contract: Full-time.
Research Group / Department / School:	Wolfgang Schmitt's Group, School of Chemistry/CRANN, Trinity College Dublin, the University of Dublin
Location:	Trinity College Dublin, the University of Dublin College Green, Dublin 2, Ireland
Reports to:	Prof. Wolfgang Schmitt, School of Chemistry
Salary:	Appointment will be made on the SFI Researcher Salary Scale on the Experienced Post Doctoral Researcher (Level 2B), the New Post Doctoral Researcher (Level 2A) or the Research Assistant scale depending on experience; https://www.sfi.ie/funding/sfi-policies-and-guidance/budget-finance-related-policies/SFI-Team-member-scales_October-2022-plus-future-pay-increases-March-and-October-2023-(1).pdf
Duration/ Hours of Work:	Initially 24 months; full-time;
Closing Date:	10 th November 2023, 4pm (Dublin Time)

Posts Summary

Postdoctoral Researcher/ Research Assistant in Mechanical engineering

Over the last decade, CO₂ capture from air (Direct Air Capture - DAC) has been widely investigated. Among the possible technologies, vacuum temperature swing processes are among the most promising but require extensive work to reduce the capital and operational costs, notably in smart designs using mechanical engineering, heat transfer simulation and vacuum process optimizations. The project aims to design, build, deploy and optimize an industrial prototype (capture rate: 20 t/year), to select adequate auxiliary equipment's (e.g. vacuum pumps, valves, heat pumps, etc.) and to perform preliminary design of a commercial product with a capture capacity of 200 t/year. The project has a strong focus on commercial applications and is part of a €2.5 Mio European Innovation Council grant which aims to progress a new DAC technology which was developed by Prof. Wolfgang Schmitt and Dr. Sebastien Vaesen at Trinity College.

Standard Duties and Responsibilities: The successful researcher will conduct research in the outlined areas of Direct Air Capture by amino-adsorbents. Activities and duties include:

- DAC industrial prototype design, construction, commissioning, deployment and optimization;
- Simulation of DAC regeneration process by heat and mass transfer simulation;
- Development of innovative adsorber designs;
- Use 3D & 2D CAD software to produce models;
- Interactions with suppliers and subcontractors;
- Provision of guidance to undergraduate students in the research laboratory;
- Preparation of manuscripts for publication;

- Preparation of patent applications;
- Research project management;

The candidate will work closely with the other team members, sharing knowledge and skills with team members. The post offers flexible working hours. To develop strong interactions and collaborations within the team, it is generally expected that the candidate will work on-site.

Research Group/Department/School: Prof. Wolfgang Schmitt's Group, School of Chemistry/CRANN, Trinity College Dublin, the University of Dublin

Funding Information: The position is funded by the European Innovation Council. Appointment will be made on the SFI Researcher Salary Scale on the Experienced Post-Doctoral Researcher, (Level 2B), New Post-Doctoral Researcher (Level 2A) or Research Assistant scale; depending on experience ([https://www.sfi.ie/funding/sfi-policies-and-guidance/budget-finance-related-policies/SFI-Team-member-scales_October-2022-plus-future-pay-increases-March-and-October-2023-\(1\).pdf](https://www.sfi.ie/funding/sfi-policies-and-guidance/budget-finance-related-policies/SFI-Team-member-scales_October-2022-plus-future-pay-increases-March-and-October-2023-(1).pdf))

Duration/ Hours of Work: Initially 24 months; full-time;

Qualifications: The ideal candidate will have a Ph.D. degree in an area of Engineering underpinning the project areas. Engineering graduates with at least 2 years' experience in the project areas are also encouraged to apply.

Knowledge & Experience:

- Extensive expertise in heat and mass transfer simulation is required;
- Expertise in vacuum vessel mechanical design is required;
- Expertise in the design, construction and commissioning of industrial prototypes is desirable;
- Expertise simulations using state-of-the-art software (*e.g.* gPROMS, ASPEN, MATLAB, Python, etc.) is desirable;
- Expertise in CAD 3D & 2D software (*e.g.* Autodesk software suite) is desirable;
- Expertise in the area of adsorption processes will be of advantage;
- Expertise in PLC programming will be of advantage;
- Excellent presentation, language and communication skills are required;
- The candidate should have expertise in relation to the preparation of the manuscripts for publication;
- Excellent word processing, data presentation and IT skills are required;

Application Procedure:

The application should include:

- a Curriculum Vitae including the names and contact details of 2 referees and
- a short cover letter

Applications from all backgrounds are encouraged, especially from any groups underrepresented in STEM disciplines. Female candidates are encouraged to apply. Informal enquiries are welcomed.

Documents should be submitted to Prof. Wolfgang Schmitt (schmittw@tcd.ie) **AND** Dr. Sebastien Vaesen (vaesens@tcd.ie). Please use **EIC-ENG-MECH** in your email title.

Trinity College Dublin, the University of Dublin

Trinity is Ireland's leading university and is ranked 81st in the world (QS World University Rankings 2024). 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 17th most international university in the world (Times Higher Education Rankings 2020) 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 the top-ranked European university for producing entrepreneurs for the past five successive years and Europe's only representative in the world's top-50 universities (Pitchbook Universities Report).

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.

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>.