



Post Specification

Post Title:	PhD Scholarship on Supersonic Spray Advanced Modelling
Post Status:	3 to 4 years (starting March 2014)
Department/Faculty:	School of Engineering
Reports to:	Dr Rocco Lupoi
Salary:	Funding is available to fully cover registration fees for a EU/EEA student for 4 years, plus a student stipend of approximately €14k per year (tax free) for a period of 3 years.
Closing Date:	12noon on 20 th January 2014

The student will preferably start on the 1st of March 2014.

Post Summary

An exciting and fully funded PhD position exists in Trinity College Dublin (Ireland), within the Department of Mechanical & Manufacturing Engineering. The successful candidate will be supervised by Prof. Rocco Lupoi and will be affiliated to the Manufacturing Technology and Systems Research Group.

Background to the Post

The project is aimed at the development of the next generation multi-phase simulations in Cold Spray. CS is a novel manufacturing process and is used to produce coatings in a solid-state manner onto engineering components through the acceleration of particles in a supersonic nozzle. The student will focus on the modelling of carrier gas (Nitrogen or Helium)-particles interactions during the acceleration process and will use Computational Fluid Dynamics (CFD). The main objective is to create a reliable and robust numerical tool for the design of innovative nozzles with the added capability of being able to control the particle beam geometry at the nozzle exit. The student will also use Particle Image Velocimetry (PIV) systems to validate the models experimentally.

Funding Information

Funding is available to fully cover registration fees, plus a student stipend of approximately €14k per year (tax free) for a period of 3 years. The student is expected to fully or partially use the 4th year (if required) mainly for the writing of the thesis.

Person Specification

Qualifications

- An engineering degree, preferable in mechanical engineering, with a final equivalent score of 2.1 or above.
- Highly interested and motivated to achieve a PhD degree.
- Attended and passed modules on fluid mechanics and maths.



Knowledge & Experience (Essential & Desirable)

- Good level of written and spoken English.
- Experience at undergraduate level (through the final year project or single taught modules) of using CFD packages (such as Ansys-Fluent, OpenFoam or CFX) and/or Matlab.

Further information about research groups and department can be found at the address below:

<http://www.tcd.ie/mecheng/research/manufacturing-tech-systems/>

Trinity College Dublin

Founded in 1592, Trinity College Dublin is the oldest university in Ireland and one of the older universities of Western Europe. On today's campus, state-of-the-art libraries, laboratories and IT facilities, stand alongside historic buildings on a city-centre 47-acre campus.

Trinity College Dublin offers a unique educational experience across a range of disciplines in the arts, humanities, engineering, science, human, social and health sciences. As Ireland's premier university, the pursuit of excellence through research and scholarship is at the heart of a Trinity education. TCD has an outstanding record of publications in high-impact journals, and a track record in winning research funding which is among the best in the country.

TCD has developed significant strength in a broad range of research areas including the 18 broadly-based multi-disciplinary thematic research areas listed below.

Sustainable Environment	Next Generation Medical Devices	Identities in Transformation
Smart and Sustainable Cities	Creative Technologies – Digital Media, Arts and Entertainment	International Development
Cancer	Neuroscience	Immunology and Infection
Nanoscience	Telecommunications	Creative Arts Practice
Inclusive Society	Mathematics of Complexity	Intelligent Media and Human Communication
Ageing	International Integration	Digital Humanities
Genes and Society	Making Ireland	

Its current flagship interdisciplinary research institutes are in areas such as biomedical science, arts and humanities, neuroscience, international integration studies, and nanostructures and



nanodevices. The construction of Ireland's first purpose built nanoscience research institute, CRANN, was opened in January 2008, which houses 150 scientists, technicians and graduate students in specialised laboratory facilities.

The building also includes an innovative public venue, the Science Gallery. In 2011, it received the Shorty Award for Best Cultural Institution on Twitter globally and the Irish Web Award for Best Education and Third Level Website. These joined a list of awards that includes European Museum of the Year Award – Special Commendation 2010 and National IT award for best use of technology in education, 2009.

The recently opened Trinity Biomedical Sciences Institute (TBSI) is an unprecedented development for Biomedical Research in Ireland, both in terms of scale and ambition. It

provides a facility for TCD to continue its upward trajectory in both basic and translational research programmes, notably in the areas of Immunology, Cancer and Medical Devices.

The Library of Trinity College is the largest research library in Ireland and is an invaluable resource to scholars. In addition to purchases and donations accrued over four centuries, the College has had 200 years of legal deposit. By this right Trinity can claim a copy of every book published in Ireland the UK. The Library has over 4.25 million books, 22,000 printed periodical titles and access to 60,000 e-journals and 250,000 e-books. The Library's research resources also include internationally significant holdings in manuscripts (the most famous being the Book of Kells), early printed material and maps. Its collections and services support the College's research and teaching community of 15,000+ students and academic staff.

Trinity continues to attract intellectually strong students from Ireland and abroad. More than half of its incoming undergraduates have earned in excess of 500 out of a maximum 600 points in the national Leaving Certificate examination. The accessibility of a Trinity education to all students of ability is also very important. Trinity College was the first university in Ireland to reserve 15% of first year undergraduate places for students from non-traditional learning groups – students with a disability, socio-economically disadvantaged students as well as mature students. The College has met its target in this respect. There is also an exciting international mix of its student body where 16% of students are from outside Ireland and 40% of these students are from outside the European Union. TCD students also have an opportunity to study abroad in other leading European universities through Trinity's partnership agreements.

Students also benefit from a scholar teacher model where they have the opportunity of being taught by world-leading experts in their field. Interdisciplinarity forms a key element in the College strategy in increasing Trinity's international standing as a research-led university.

Many of Trinity College Dublin's alumni have helped shape the history of Ireland and Western Europe. They include author, Jonathan Swift, philosopher, George Berkeley, political philosopher, Edmund Burke, wit and dramatist, Oscar Wilde, historian, William Lecky, religious scholar, James Ussher, scientists, John Joly, George Johnstone Stoney, William Rowan Hamilton and physicians, William Stokes and Denis Burkitt.



Two of Trinity College's alumni have won Nobel prizes – Ernest Walton for Physics in 1951 and Samuel Beckett for Literature in 1968. The first President of Ireland, Douglas Hyde was a graduate as was the first female President of Ireland, Mary Robinson.

Equal Opportunities Policy

Trinity College Dublin is an equal opportunities employer and is committed to the 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.

Application Procedure

Candidates should submit a ½ page cover letter together with a 2 page full curriculum vitae, exams list with scores to include the names and contact details of 3 referees (email addresses if possible) to Rocco Lupoi at lupoir@tcd.ie