Job Title: RINN Semiconductors PhD scholarship on the "Development of student's competences in semiconductor education"

Rinn Semiconductors is part of a constellation of seven major new centres funded by Research Ireland, which collectively represent an investment of €460M in advanced research by the Government of Ireland. Rinn Semiconductors aims to lead Ireland's response to the end of Moore's Law scaling, the point where traditional improvements in computer chips slows down or ends, by pioneering modular integrated circuit-based (chiplet-based) semiconductor design and integration. With deep expertise in the areas of Heterogeneous Integration and Advanced Packaging, the Rinn Semiconductors team propose to enable transformative advances in these technologies and to apply them in three main application areas: Future Internet, Sustainable Energy and Environment, and Digital Healthcare. A key objective of the Rinn is to foster deep collaboration across the seven universities and institutions involved, by leveraging the semiconductor fabrication facilities at Tyndall, ultimately creating a cohesive "atom to systems" value chain in Ireland, connecting everything from basic materials research through to complete technology solutions. The Rinn will operate in close collaboration with Ireland's vibrant semiconductor industry sector which supports 20,000 high skilled jobs and includes world leading multinational companies, small and medium sized enterprises and start-ups.

It is within this context that we are recruiting a PhD candidate to conduct research in Physics and Engineering Education, primarily based at Dublin City University, and working in collaboration with researchers at Tyndall National Institute, Cork.

About Dublin City University:

Dublin City University was founded in 1981 and comprises over 20,000 students including 4669 postgraduate students, of whom 960 are research students. Following the incorporation in 2016 of leading colleges of education (St Patrick's College, Drumcondra; Mater Dei Institute of Education; Church of Ireland College of Education) into the University, the number of DCU staff members increased from 400 to over 650. The University is now a multi-campus university occupying approximately 60 hectares just north of Dublin City Centre. Having grown its student population by more than 50% in the past five years, DCU is Ireland's most innovative university and fastest growing university and delivers more than 200 programmes across its five faculties, Humanities and Social Sciences, Science and Health, Engineering and Computing, DCU Business School and DCU Institute of Education.

The Times Higher Education Young University Rankings list the world's best universities that are 50 years old or younger. The universities are judged across all their core missions – teaching, research, knowledge transfer and international outlook – to provide the most comprehensive and balanced comparisons available. Excellence in DCU's education and research activities has resulted in the University being consistently ranked among the top young universities worldwide, with DCU placed 59th globally in the 2024 rankings. Nationally, DCU has been named Sunday Times 'University of the Year' three times (2004, 2010, 2021). Dublin City University has again risen in the 2026 Times Higher Education (THE) World University Rankings, to its highest position ever. It is now ranked among the top 350 universities in the world. The THE World University Rankings provide the definitive list of the world's best universities, with an emphasis on the research mission. Dublin City University ranked 1st in Ireland for Research Quality. Research Quality measures the influence and impact of published research, and by this measure, not only is DCU number one in Ireland but 138th in the world. DCU's objective is to use these results to develop its research reputation, and to further strengthen the impact of its research in meeting the serious economic and social challenges facing Ireland and Europe at this time.

About the Project:

The PhD project is aligned with RINN Semiconductor's commitment to engaged research, with a vision to raise awareness of the critical role that semiconductor technologies and applications have for today's society towards addressing global challenges such as energy, climate, sustainability, healthcare.

Semiconductors are ubiquitous in our society and make a substantial impact to the Irish economy and society. The goal of this research is to examine factors that influence young people's participation and engagement in STEM education in Irish schools and develop strategies to address barriers to young people's continuation in STEM education in upper secondary and university level. In 2023, over 56% of Leaving Certificate students in Ireland studied biology, however participation in areas related to physical sciences – physics, chemistry and engineering – are persistently lower. Just 7,526 students (12.2%) took physics, 9,750 (15.8%) took chemistry, and 6,323 (10%) engineering. Delving further into the data, women representation studying physics was just 27%, which means that only 6.5% of women studied physics for their Leaving Certificate in 2023.

The successful candidate will be engaged full-time in their research and will be primarily based in Dublin City University (DCU). In addition to completing their doctoral thesis, the successful candidate will be expected to contribute to related research outputs in the form of academic papers and/or presentations at conferences in Ireland and abroad, and to engage in graduate training courses as required by DCU's Academic Regulations for Postgraduate Degrees and by the project supervisors.

Key Duties & Responsibilities:

- To investigate
    - what core concepts of semiconductors and nanotechnology are included in the primary and secondary curricula
    - what supports do students need to deepen their learning, engagement and motivation for studying physical sciences at primary and secondary level.
    - what teaching and assessment methods are appropriate for supporting primary, secondary and tertiary student learning and engagement in physical sciences.
    - the design and development of effective strategies and resources to support students' development of core competences during primary and secondary education, e.g. spatial reasoning, modelling, design thinking, that support undergraduate physics and engineering education.
- Present research findings at in major conferences and publish in high-impact journals.
- Complete required PhD coursework, participate in group meetings, and contribute to education and public engagement activities.
- To conduct a specified programme of research under the supervision and direction of the Lead and co-supervisors.
- To engage in appropriate professional development opportunities suggested by the supervisory team.
- To collaborate with the wider team of researchers within the research programme.
- To assist in the supervision of undergraduate projects.
- To engage in innovation, commercialisation and entrepreneurship opportunities, including target collaborative projects with industry.
- To engage and contribute to EU collaborative projects, where appropriate.
- To participate in Education and Public Engagement activities.

- To ensure compliance with DCU's Quality Management Systems, Health and Safety standards, and other regulations.
- To carry out any additional duties that may reasonably be required within the general scope and level of the post.
- Full roles and responsibilities of research students within DCU are described in DCU's Postgraduate Research: Academic Regulations & Guidelines

Essential Criteria:

- First or upper second-class honours degree (or equivalent international qualification) in Physics, Engineering, Physics teaching, Engineering teaching or related discipline.
- Strong interest in STEM Education.
- Strong analytical and critical thinking skills.
- Self-driven and able to work as part of a multidisciplinary research team.
- Proficiency in written and spoken English.
- Ability to communicate and explain complex
- Demonstrable collaborative initiatives.

Desirable Criteria:

- Master's degree in physics or engineering or related discipline.
- Experience with designing and teaching Physics, Engineering or related STEM discipline.
- Experience of research and evaluation.

What We Offer:

Apart from offering a position in a very successful and positive research environment, with a collaborative ethos full of diverse competencies to boost your career, we offer the following:

- A fully funded PhD position that includes a stipend of €25,000/annum for up to four years and full coverage of academic fees. The successful candidate will be registered as PhD student at Dublin City University.
- As a student in the RINN Semiconductors Centre you will join a vibrant, supportive and engaging cohort of 15 students and will have the chance to travel and attend a bespoke induction programme with students from partner organisations, an annual training school and have access to advanced courses in areas such as semiconductor fabrication, packaging and entrepreneurship.
- Equity & Inclusion: Athena Swan Bronze award holder, with ongoing initiatives led by a dedicated People and Culture team to ensure equity for all.
- Core Values: A culture grounded in Ambition, Collaboration, Diversity, Excellence, and Integrity.

Application Process:

To apply, please email the following documents to Dr. Eilish McLoughlin (Eilish.mcloughlin@dcu.ie) with "Rinn Semiconductors PhD" as the subject line:

- Cover letter outlining your interest and suitability for the project.
- 2-page CV, including a list of publications (if any).
- A copy of your degree certificate or transcript (for applicants who have not yet graduated, please provide a list of modules and results obtained to date).

Suitable candidates will be shortlisted and invited for interview.

Informal inquiries should be directed to Dr Eilish McLoughlin (Eilish.mcloughlin@dcu.ie)