



Fully Funded PhD Position in the Area of
Probabilistic Quantum Communications Networks
Department of Electronic Engineering
Maynooth University, Ireland

The Department of Electronic Engineering at Maynooth University is pleased to announce that 1 PhD studentship is available with the start date of early 2022 on the subject of **Probabilistic Quantum Communications Networks - Theoretical Framework and Capacity Calculations (QuCommNet)**.

Open position	1 PhD Studentship in Electronic Engineering/Quantum Communications/Quantum Networks
Location	Department of Electronic Engineering, Maynooth University
Duration	4 Years
Funding / Stipend	The PhD position is funded for 4 years, including a monthly stipend and a travel budget to present at international conferences, workshops and seminars. The studentship will be €24,000 per annum including tuition fees and budget for travel and consumables.
Contact	Dr. Indrakshi Dey (indrakshi.dey@mu.ie)
Closing Date	Friday 31 st Dec 2021

General Research Theme of the PhD Project

The main goal of QuCommNet is to theoretically model a probabilistic quantum communication network carrying classical and quantum information and formulate network capacity for such a network. Every node will have a given probability of connecting with another node within the network. The nodes that have a high probability of being connected are grouped into a cluster. Therefore, all nodes within a given cluster are entangled with each other and they share a common Einstein–Podolsky–Rosen (EPR) state.

PhD Studentship

The PhD position is funded for 4 years, including a monthly stipend and a travel budget to present the research outputs at international conferences, workshops and seminars. The studentship will be €24,000 per annum. The successful candidate will be enrolled on the PhD programme in the Department of Electronic Engineering at Maynooth University. The successful candidate will write their thesis on topics related to Probabilistic Quantum Communications Networks, supervised by Dr. Indrakshi Dey (Maynooth University), Dr. Marco Ruffini (Trinity College Dublin), Dr. Harun Siljak (Trinity College Dublin) and Dr. Nicola Marchetti (Trinity College Dublin) for the entire duration of their PhD programme. The successful candidate will be an integral part of the overall research programme and interdisciplinary team that Dr. Dey, Dr. Ruffini, Dr. Siljak and Dr. Marchetti are leading around the topic of quantum communication networks. The successful candidate will be prepared to work with Dr. Dey's network of collaborators who are among the leading scholars working on state-of-the-art technologies in quantum communications and networking.

In addition to PhD supervision, the successful candidate, where relevant, will benefit from a wide range of training activities, namely, a range of modules for transferable skills such as research integrity, research management, entrepreneurship, patents, etc. The student may also benefit from summer/winter schools and an overseas research visit to our collaborators in the US, Canada, UK and all around Europe. The successful

candidate will be supported to present his/her research findings at major international conferences, workshops and seminars within the scope of the research project.

Duties and Responsibilities

1. Undertake postgraduate research in the area of agreed research project.
2. Work closely with the academic supervisor to ensure that the progress of the individual project is in line with the objectives of Dr. Dey's research programme.
3. Work effectively within a multidisciplinary environment that includes physicists and mathematicians.
4. Attend and participate in all training events and supervisory meetings.
5. Prepare PhD progress reports.
6. Present and publish research outputs to both academic and non-academic audiences.
7. Attend and participate in academic and non-academic conferences, events and seminars.
8. Contribute to teaching/training of undergraduate and postgraduate project students working with Dr. Dey's group.

As the description of the duties and responsibilities cannot be exhaustive, it is worth mentioning that the PhD student may be required to undertake other duties that are broadly in line with the objectives of the research project.

Qualifications, Expected Skills and Competencies

1. PhD applicants must hold at least a first-class honours Bachelor's or Master's degree in Electrical, Electronic Engineering, Computer Science, Physics, Wireless Communications, Mathematics, or a related discipline.
2. Excellent background in physics/mathematics/signal processing.
3. An aptitude for experimental work with electronics.
4. Strong mathematical, analytical, and programming skills.
5. Highly proficient English language skills.
6. Excellent written and verbal communication, including presentation skills.
7. Excellent organisational skills, attention to detail and the ability to meet deadlines.
8. Ability to think logically, create solutions and make informed decisions.
9. Willingness to work collaboratively in a research environment.
10. A strong commitment to their own continuous professional development.

Application Process / Additional Information

Applications must be sent by e-mail to Dr. Indrakshi Dey (indrakshi.dey@mu.ie). Early applications are strongly encouraged.

Applications should include:

1. A cover letter explaining the applicant's motivation and interest in the project topic. Any relevant background and/or experience needs to be mentioned.
2. A Curriculum Vitae that includes the applicant's educational qualifications and any scientific publications and achievements.
3. Academic transcripts.
4. Two academic references.

Informal enquiries concerning the advertised position, accompanied with the CV and a motivation letter, can be made to Dr. Indrakshi Dey (indrakshi.dey@mu.ie). The deadline to submit application is 5pm (GMT) **Dec 31st 2021**. The received applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a Skype interview.