



University College Dublin
Ireland's Global University

Fully Funded PhD Position in Quantum Communication

School of Electrical And Electronic Engineering

University College Dublin (UCD):

Ireland's largest university, University College Dublin is ranked within the top 1% of higher education institutions worldwide. The university is located on a stunning 330-acre parkland campus in the vibrant south Dublin suburbs, home to three beautiful lakes. Dublin, the capital of Ireland, is renowned for its energetic atmosphere, rich cultural history, and bustling technology sector.

About the Position:

We are recruiting a highly motivated PhD student to work on cutting-edge research in **Quantum Communication, Quantum Machine Learning, and Satellite Communication**, with a special focus on the **Integration of Classical and Quantum Communication systems**. This research aims to bridge the gap between classical and quantum technologies, pushing forward the development of hybrid communication networks where both paradigms work together to achieve unprecedented performance and security.

Key areas of exploration include:

- **Quantum Algorithms and Protocols** for secure communication
- **Quantum Sensing** technologies for enhanced detection and measurement systems
- **Quantum Information Theory** to understand the fundamental limits and capabilities of quantum systems
- **Satellite-based Quantum Communication** architectures for secure global communication

This project will offer opportunities to explore how classical communication networks can be augmented by quantum communication techniques, creating efficient and scalable solutions for real-world applications.

Candidate Profile:

We are looking for candidates with:

- A strong academic background in **Computer Science, Electrical Engineering, Physics, Mathematics** or related disciplines, with a minimum 2.1 honours degree. A **Master's degree** with research experience is highly desirable.
- Expertise or keen interest in **Quantum Communication, Quantum Algorithms, Satellite Communication, or Machine Learning**.
- Proficiency in **programming** (especially **Python** and **MATLAB**) and familiarity with **AI/ML frameworks**.

- Solid understanding of **Communication Theory, Statistical Signal Processing, and Information and Coding Theory**, or a demonstrated willingness to master these concepts.
- Excellent problem-solving skills, self-motivation, and the ability to collaborate in a multidisciplinary research environment. Excellent written and oral communication skills.
- Fluency in English, meeting UCD's Postgraduate English Language Entry Requirements.

Responsibilities:

The successful applicant will:

- Undertake a **four-year research project** within **UCD's structured PhD programme**.
- Contribute to academic publications and present research findings at international conferences.
- Engage with the broader academic community by participating in teaching activities and relevant UCD modules.

Funding:

This full-time PhD position is fully funded by School of Electrical And Electronic Engineering, University College Dublin, offering:

- A stipend of up to €22,000 per annum, and student fees covered.
- Funding for up to **four** years.

Application Process:

To apply, please submit the following documents via email to **Dr. Anshu Mukherjee** (principal supervisor, anshu.mukherjee@ucd.ie) and **Dr. Avishek Nag** (avishek.nag@ucd.ie):

1. **Research statement** (maximum 2 pages), outlining your interest and suitability for the project.
2. **CV** including a full academic transcript of all degrees.
3. Contact details of at least **three referees**.

Please use the subject line: **UCDANM2024 - [applicant surname]** in all correspondence related to this application.

Application Deadline: 21st November 2024, 5 pm GMT.

Start Date: The position is available to start **immediately** or as early as possible, with a latest start date of **February 2025**.