

# Position Offered: UNIVERSITY GRADUATE

## Project: *Quantum Communication with Integrated Photonics and Superconducting Devices*

**Technological and scientific fields:** Quantum Technologies and Cybersecurity

**Location:** Madrid, Instituto de Tecnologías Físicas y de la Información "Leonardo Torres Quevedo" (ITEFI) <https://www.itefi.csic.es/es>

**Research Group/PI:** Cryptography and Information Security, Verónica Fernández Mármol

### PROJECT SUMMARY

Quantum communication is a strategic field addressing security challenges posed by quantum computers' ability to break modern cryptographic techniques. This project aims to advance quantum communication by exploring the miniaturization of Quantum Key Distribution (QKD) devices using Photonic Integrated Circuits (PICs), that offer advantages such as low power consumption and compatibility with electronics, paving the way for cost-effective mass production of QKD devices. The main objective of the project is to design, fabricate, and characterize PICs for QKD implementation. The tasks involved in this contract include exploring QKD protocols for integrated implementation, designing PICs to function as QKD transmitters and receivers, characterizing them, and implementing QKD in laboratory settings and real-world applications such as mobile or airborne scenarios.

### PROFESSIONAL PROFILE

#### Minimum requirements:

- Academic qualification required: graduate in Physics
- Proficiency in Spanish and English
- Proven knowledge about the main fields of the project: quantum communications and integrated photonics

#### Merits to be considered:

- Postgraduate academic degrees: PhD and masters in relevant and related fields
- Other academic degrees
- Research experience: publications and congress contributions related to the field of the project
- Experience in managing and participating in research projects
- Proven ability to work in a team and collaborate with other research groups
- Experience in teaching or supervising undergraduate and graduate students

### WHAT IS OFFERED

The hired individual will have the opportunity to join a pioneering quantum communications research group in Spain and collaborate with various CSIC groups (IMB and IFF) to achieve the project's objectives. During their training at the center, they are expected to complete a total of 230-290 ECTS of activities, including research and experimentation, project collaboration and management, teaching, training courses, and conference participation between others. Additionally, the hiree will undertake training stays at national and international centers.

#### Contract conditions:

Indefinite contract for a University Graduate associated with the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (37.000 € - 41.000 €).

**Start of contract: before 31 December 2024**

### PRINCIPAL INVESTIGATOR CONTACT

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