

The Portuguese Quantum Communication Infrastructure

About the PTQCI Project

The **Portuguese Quantum Communication Infrastructure (PTQCI)** project is the first land segment of the **European Quantum Communication Infrastructure (EuroQCI)** in Portugal and is the first step towards the integration of the European infrastructure.

PTQCI should enable the deployment of a highly secure, scalable, and resilient network based on **Quantum Key Distribution (QKD)** between different public authorities in Lisbon, as well as a testbed network involving academic and private stakeholders, and plan its expansion to other sites in Portugal and Spain, and connection to space assets.

PTQCI will safeguard **sensitive data and critical infrastructures** by integrating quantum-based cryptographic systems into existing communication infrastructures.

PTQCI is part of a roadmap for deploying **national secure communication infrastructures** and technology provision, and builds on previous milestones achieved, and currently in implementation by the core team on the past few years:

→ Advanced theoretical and practical experiments with quantum key distribution (QKD) and cryptographic protocols leading to the successful demonstration of a quantum secure link between two PT military sites using exclusively national technology (**QSCRIPT PROJECT, 2021**);

→ PT leadership of a major project under EDIDP and supported by MoD and industry from Spain, Italy, and Austria aiming at integrating and combining Software Defined Networks (SDN) and QKD technologies on top of legacy optical networks to build a highly secure, scalable, and resilient network control architecture for advanced operational services and develop national cipher machines (**DISCRETION PROJECT, 2021 - 2025**).



PTQCI Objectives

- To standardize and deploy a **SDN enabled by QKD over existing fiber infrastructures**, making use of European components and PT-designed cipher machines with the objective of sharing secure information between different governmental/public institutions in Portugal;
- To demonstrate **secure communications between public authorities and Defense buildings**, preparing the expansion of the network to farther locations in Portugal, to a favorable location where an Optical Ground Station (OGS) shall be implemented to allow the connection between ground and space segment of EQCI;
- To implement in parallel a testbed network to test new **technologies preparing the roadmap of PTQCI**, using free space links, 5G/IoT, and considering different use cases;
- To enable **training and educational activities**, for instance promoting the use of this infrastructure by the European Cyber Academia and Innovation Hub (EU CAIH) providing a vital contribution to strengthening national, NATO, and EU's capability to defend against the threats of the digital world.



Consortium & Work Packages

The **consortium** that will design and develop PTQCI is constituted by **different types of institutions** that are key players in Portugal:



The PTQCI project is composed by the **5 work packages (WPs)**:

