# 1ˢᵗ CYQCI newsletter

## June 2024

Cyprus University of Technology · cyta · DEC DEPARTMENT OF ELECTRONIC COMMUNICATIONS · COMMISSIONER OF COMMUNICATIONS | Digital Security Authority · CYNET CYPRUS RESEARCH AND ACADEMIC NETWORK

## Project Consortium

The CYQCI project brings together the following diverse consortium of essential stakeholders:

►The project is coordinated by the **Cyprus University of Technology** (CUT).

►Two network providers, including the incumbent network provider for Cyprus, namely the **Cyprus Telecommunications Authority** (CYTA), and the academic network provider, **Cyprus Research and Academic Network** (CYNET).

►The **Department of Electronic Communications** (DEC), under the Deputy Ministry of Research, Innovation and Digital Policy (DMRID), and The **Digital Security Authority** (DSA) are vital partners as they are responsible for the security and communication policies in the country. The DMRID is co-funding the project.

## The Project

### The objectives

● **Deployment of an advanced experimental quantum network**

● **Demonstration of vital use-cases:** Enhancing security for crucial national operations.

● **Establishment of the foundation for EU Connectivity:** Developing an optical ground station to facilitate connectivity with the EU.

● **Kick-start local research in QKD:** Developing pilot hardware and software to support the quantum network.

● **Contribution to standards:** Participating in standardisation efforts for quantum communications.

### The network

The CYQCI terrestrial network will span three out of four major cities in Cyprus, leveraging existing optical communication infrastructure. It will demonstrate **five use-cases** involving **13 end-users**, including public organizations, critical infrastructure, academic institutions, and industrial services.

An **optical ground station** will be deployed, linking Cyprus with the broader EuroQCI network through the Eagle-1 initiative.
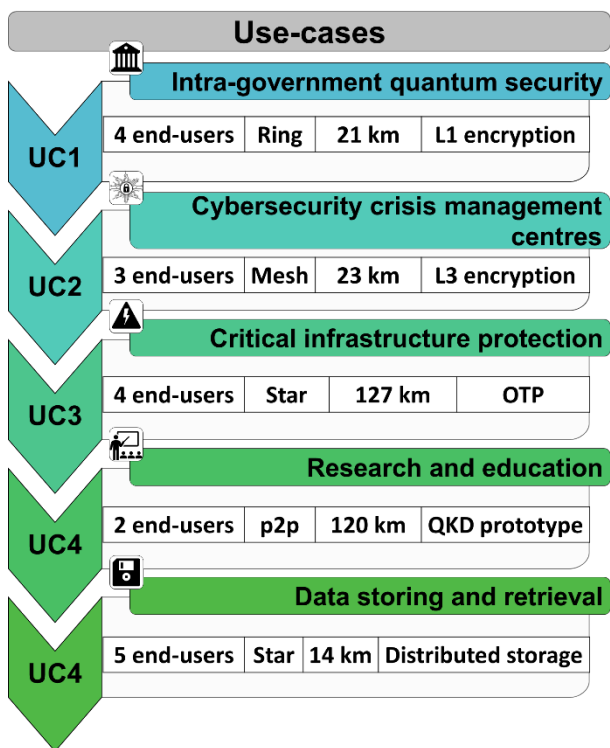
## UPCOMING EVENT

## CYPRUS QUANTUM COMMUNICATION

## INITIATIVE WORKSHOP

**4ᵗʰ – 6ᵗʰ of February 2025** (TBC)
Limassol, Cyprus

In collaboration with **PETRUS**

## Use-cases

| Use-cases | | | |
|---|---|---|---|
| **Intra-government quantum security** | | | |
| 4 end-users | Ring | 21 km | L1 encryption |
| **Cybersecurity crisis management centres** | | | |
| 3 end-users | Mesh | 23 km | L3 encryption |
| **Critical infrastructure protection** | | | |
| 4 end-users | Star | 127 km | OTP |
| **Research and education** | | | |
| 2 end-users | p2p | 120 km | QKD prototype |
| **Data storing and retrieval** | | | |
| 5 end-users | Star | 14 km | Distributed storage |

UC1, UC2, UC3, UC4, UC4

## Use-cases

Five use-cases of QKD protected networks will be implemented within CYQCI. Engaging a total of **13 end-users**, the implementations aim to introduce the technology to a significant percentage of the relevant stakeholders on the island like the **government**, **financial** and **health** institutions, **academic** entities and **critical infrastructure**.

Each use-case examines a different QKD network architecture (ring, mesh, star) such that all configurations are assessed.

Novel functionalities are also integrated including **optical switching** and **wavelength multiplexing** to ensure efficient use of resources and deployed infrastructure.

Finally, interoperability is thoroughly targeted in our deployment. We aim to demonstrate three different application layers involving the cooperation of QKD commercial devices with classical technologies from different vendor.

# RECENT HIGHLIGHTS

### Kick-off of the first quantum communications project in Cyprus

Kick-off of the first quantum communications project in Cyprus in the presence of both the Deputy Minister of DMRID and of the Director of DEC.
The project received significant attention with over 10 articles releases in both Greek and English published in local media.
Two industrial workshops on Quantum safe optical and packet networks by ADVA and on Optical satellite communications technical challenges and solutions given by Cailabs.
Presentation of CYQI at the EuroQCI Forum.
Hiring of new personnel as Research Fellows and PhDs.

### CYQCI quantum network deployed in the CUT lab

The first deployment of the network has begun in the PhOS lab of CUT. Use-cases 1 and 2 have been installed and are undergoing preliminary testing to assess the performance and suitability of the developed solution.

### CYQCI presence

The CYQCI team has participated in key conferences and workshops, sharing insights and paving new paths for collaboration. The team was invited in the panel discussion of National Plans for Quantum satcom systems in the **6th Annual ScyLight Conference** in Athens.
Technical work was presented at **SPIE Photonics Europe 2023** as well as at the **2023 Quantum Internet Workshop** in Kalavryta, Greece and the **TNC23** and **TNC24** workshops.

**Upcoming:** Meet us at **QCI Ireland** in Dublin between the 1st and 3rd of July 2024.

**Follow for more CYQCI updates**