

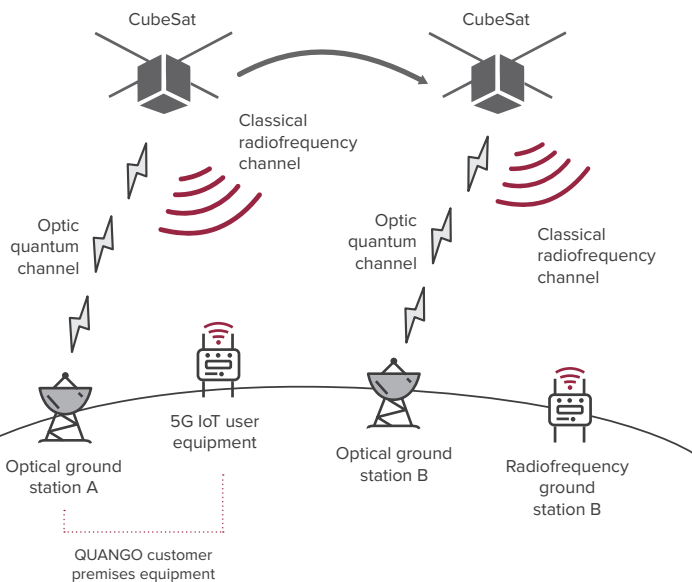
## 1 WHY IS QUANGO ESSENTIAL?

The secure exchange of sensitive information is of crucial importance in our society, as it protects money transfer, commercial transactions, medical data, remote control of critical infrastructures (power grid, telecom etc.).

Quantum key distribution (QKD) is a protocol based on the laws of quantum mechanics that guarantees unconditional security in the sharing of cryptographic keys to be used for secure communication.

5G is the fifth generation of wireless communication, as defined by the standards organization 3GPP (3rd Generation Partnership Project). Both QKD and 5G technologies require a satellite network for a global coverage of their services.

QUANGO will provide a new paradigm to share the satellite infrastructure required for secure communication based on quantum technologies and for 5G communication.



“

QUANGO will enable the combination of quantum key distribution and 5G. This will reduce the cost of both services by sharing the satellite infrastructure needed.

”



Cubesat for Quantum and 5G Communication

✉ [vallone@dei.unipd.it](mailto:vallone@dei.unipd.it)

🖱 [quango.eu](http://quango.eu)



This work is supported by the European Union's Horizon 2020 research and innovation programme under grant agreement no. 101004341.



## 2 OUR KEY OBJECTIVES

### DESIGN

QUANGO will undertake the design of a 12U low-earth-orbit CubeSat satellite which will offer combined capabilities for communication secured by QKD and for 5G connection for Internet of Things (IoT).



### DEVELOPMENT

The QUANGO partners will develop the satellite payloads and sub-systems as well as the corresponding ground stations. This will help to turn the idea into reality.



### FEASIBILITY

QUANGO will undertake a study of the feasibility of implementing such a network. We will work with a leading European bank to undertake an in-depth integration study.



The long term ambition of QUANGO is the realisation of a constellation of satellites in low orbit to offer wholesale IoT connectivity services under 3GPP standards together with key distribution services based on quantum communication.



## 3 A NEW PARADIGM EMERGES

### 1980s

#### QUANTUM KEY DISTRIBUTION (QKD)

The laws of quantum mechanics allow us to create a secure connection between two places that cannot be hacked into by any means or technology, now or on the future. First described several decades ago, QKD is now finding its way into telecommunication networks worldwide.

### 2000s

#### CUBESATS

The development of small and cost-effective standardised satellite platforms makes possible constellations of satellites that provide services over a large region.

### 2010s

#### 5G & INTERNET OF THINGS (IOT)

The fifth generation of broadband cellular network technology (5G for short) greatly increases the speed and uses for data connection. A 5G network is the perfect partner for the IoT devices, which rely on secure, low-power, and fast connections to communicate.

### 2020s

#### QUANGO

This network will combine cutting-edge developments in quantum communication, satellite development, cellular communications, and the IoT to create a unified platform for securing 5G services worldwide.

## 4 THE QUANGO NETWORK

### RESEARCH INSTITUTIONS

- L-Università ta' Malta (MT)
- ICFO - Institute of Photonic Sciences (ES)
- Sorbonne Université (FR)
- University of Padova (IT)

### COMMERCIAL PARTNERS

- Stellar Project (IT)
- Sateliot (ES)
- Argotec (IT)
- BOV (MT) - Partner Institution

### AREA OF EXPERTISE

- Quantum Protocols & QRNG
- Free-Space Optics & Channel Design
- Space Systems & Satellites
- Secure Networking
- 5G & IoT
- End User

