REGIONE DEL VENETO

esa

AGENDA DIGITALE DEL VENETO

SPAZIO al NON SPAZIO

Tecnologie digitali dallo Spazio alla Terra

2026

IN COLLABORAZIONE CON:

AIR

Veneto innovazione

INFINITE

SPAZIO al NON SPAZIO

ThinkQUANTUM

OPTICAL AND QUANTUM TECHNOLOGIES FOR CYBER SECURITY

Simone Capeleto
ThinkQuantum CEO

Data Breaches are a Significant Cybersecurity Concern

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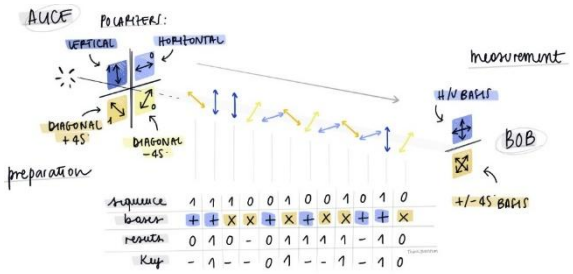
Cybersecurity is an integral part of Europeans' security[1]

"Improving cybersecurity is essential for people to trust, use, and benefit from innovation, connectivity and automation, and for safeguarding fundamental rights and freedoms, including the rights to privacy and to the protection of personal data, and the freedom of expression and information"

Quantum computing will put even encrypted data at risk – with the potential of €2 trillion in economic losses[2]

- Encryption-breaking capabilities within 5 years
- Organized crime and state-sponsored attacks (Russia China, …)
- Harvest now, decrypt later attacks (HNDL)
- Critical sectors at risk: healthcare, banking and finance, energy, etc



The Future is Quantum

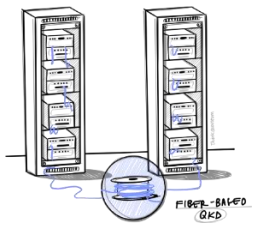
- **Quantum Key Distribution** is the future-proof solution to safeguard encryption
- **Quantum Internet** the opportunity to exploit benefits of Q-processors networking

1. EC, 2020 The EU's Cybersecurity Strategy for the Digital Decade
2. Kelley, A., 2023. An analysis projects the hypothetical disruption a cyberattack from a quantum computer.

ThinkQuantum Technologies

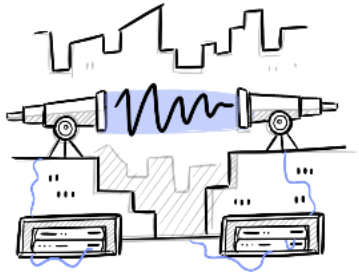
ThinkQuantum develops and manufactures **Quantum Systems (QRNG, QKD, Quantum Networking)** to offer complete **Quantum-Safe** solutions for cyber security and communication systems to both private corporations and government bodies all across the world.

ThinkQuantum **patented technology** applies to different fields and applications



Quantum Key Distribution for fiber Infrastructures

Quantum Networking Solutions (KMS, SDN)



Free-space QKD terrestrial links

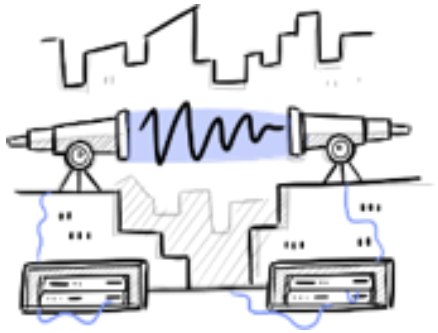
Space Domain with QKD payloads & OGS

Quantum Random Number Generation

QRNG

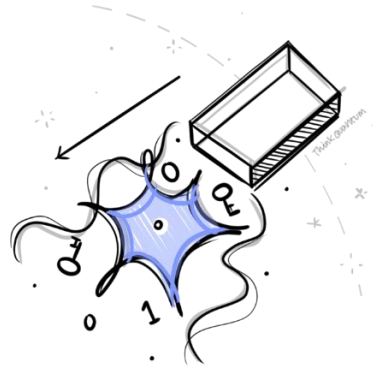
FIBER-LINK

FREE-SPACE LINK



OGT & RECEIVER

SAT QUANTUM SOURCE

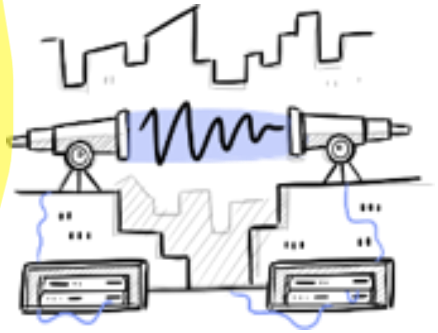


QUANTUM NETWORKING Solutions
KMS, SDN incl. Switching-mode

QRNG

FIBER-LINK

FREE-SPACE LINK



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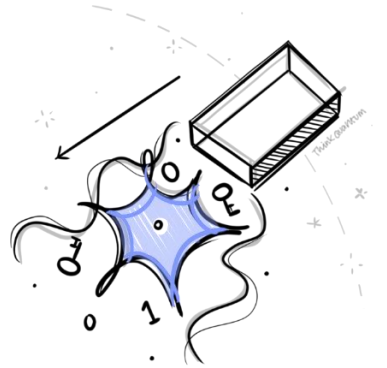

QUANTUM NETWORKING Solutions
KMS, SDN incl. Switching-mode

QRNG

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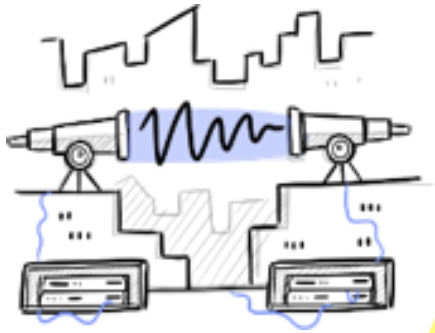

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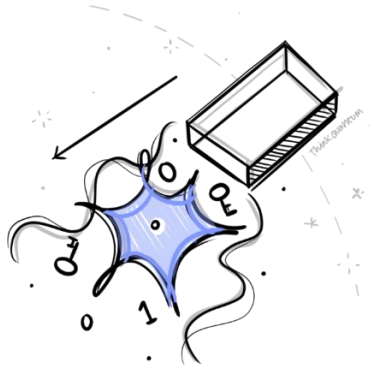
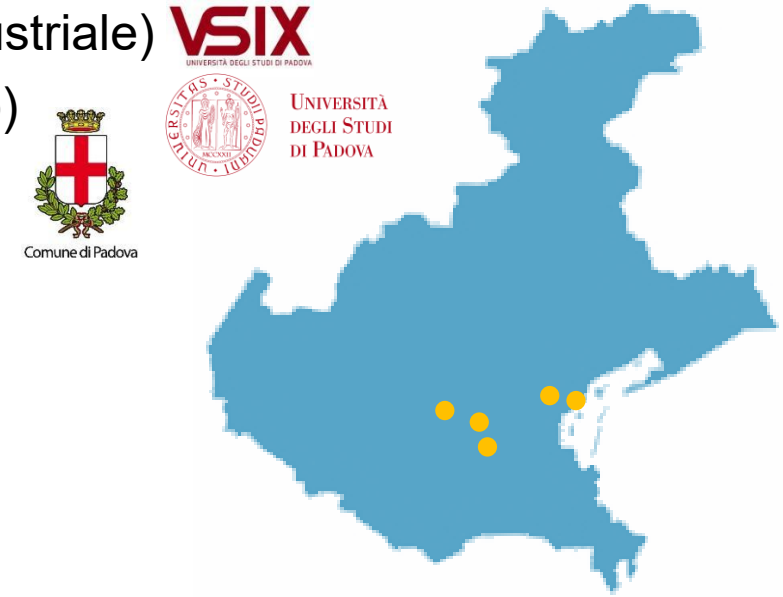


QUANTUM NETWORKING Solutions
KMS, SDN incl. Switching-mode

Il caso VenQCI
Infrastruttura Quantistica Veneta

- **I nodi**
- Regione Veneto (VEGA)
- CAV (Marghera)
- CAV (Padova Est)
- Vsix (Padova, zona Industriale)
- QuTech (Padova, centro)
- Comune di Padova



Technology partners

Ciascun **nodo** della rete è dotato di:

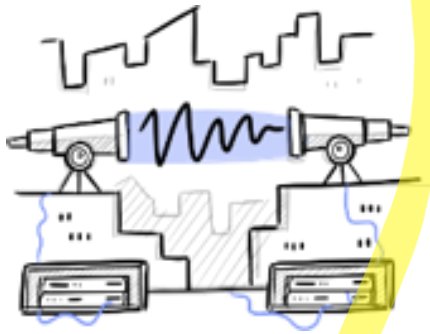
- **dispositivi per lo scambio di chiavi quantistiche (QKD) ThinkQuantum**
- sistemi di **cifratura CISCO** del traffico a **layer 2 / 100GE** con chiavi quantistiche

6 nodi
10+ kbit/s o 40+ chiavi quantistiche/s
5+ casi d'uso implementati

QRNG

FIBER-LINK

FREE-SPACE LINK



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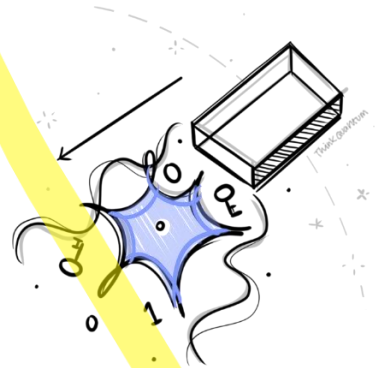
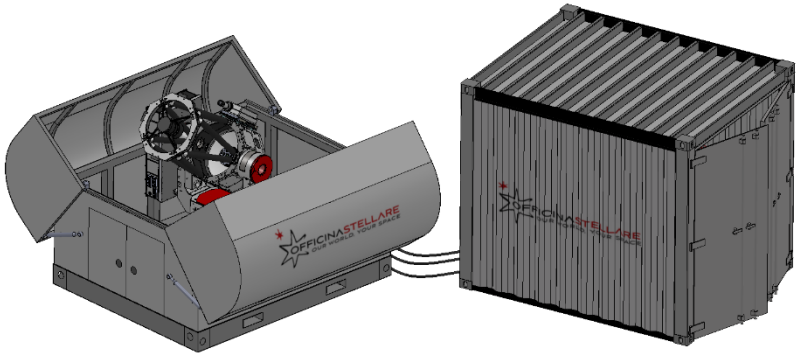


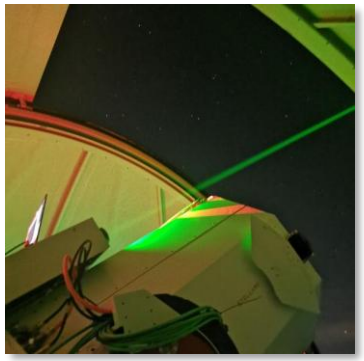
ThinKQUANTUM

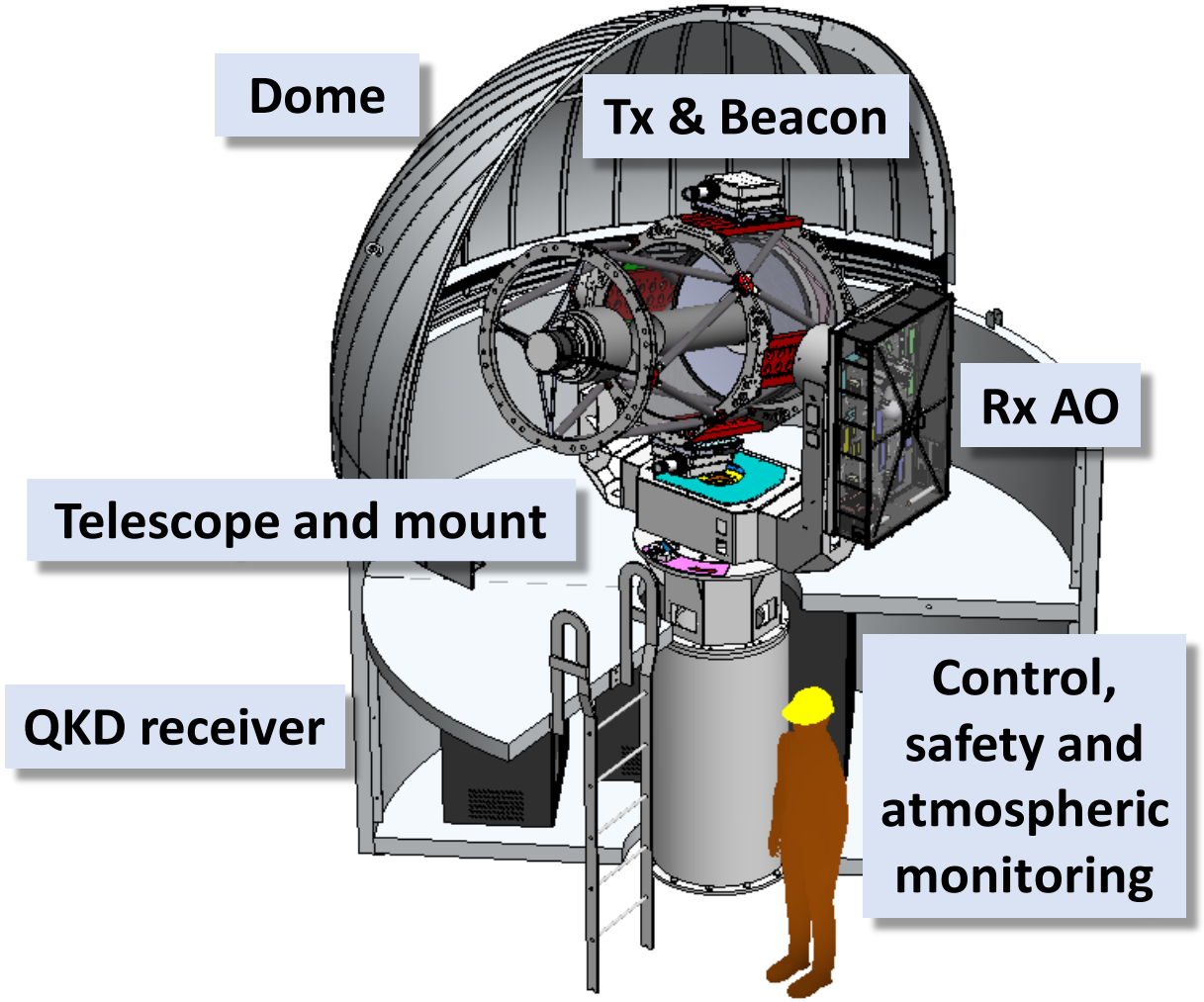
OFFICINASTELLARE
OUR WORLD, YOUR SPACE

Space Domain

ThinkQUANTUM | OFFICINASTELLARE OUR WORLD, YOUR SPACE





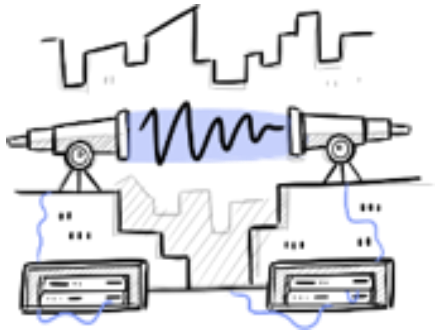


ThinkQuantum selected by ESA for the Multi-Protocol QKD Receiver **MEKY**

QRNG

FIBER-LINK

FREE-SPACE LINK



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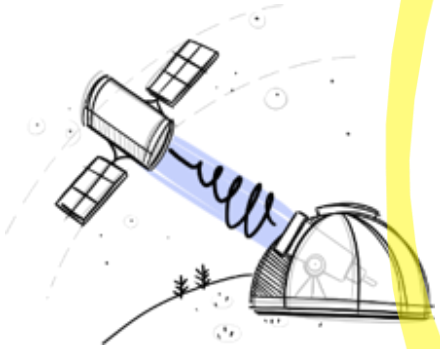
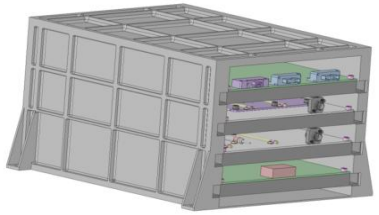


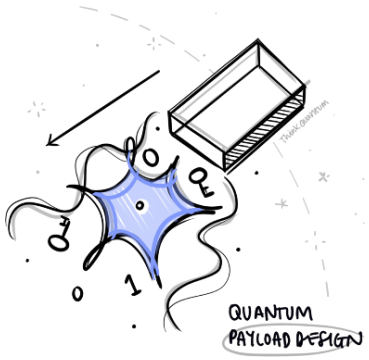
SPACE QUANTUM SOURCE

QUANTUM NETWORKING Solutions
KMS, SDN incl. Switching-mode

Space-grade Quantum Source (Prepare & Measure, EB,…)

Prepare & Measure





Technology Developoment

- SynQ
- QUDICE
- Gain-Switched DFB for QKD
- **SAGA**
- **QSVP**
- …

Related projects

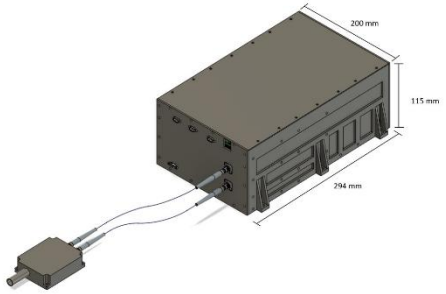
CYBER 4.0
CYBERSECURITY COMPETENCE CENTER

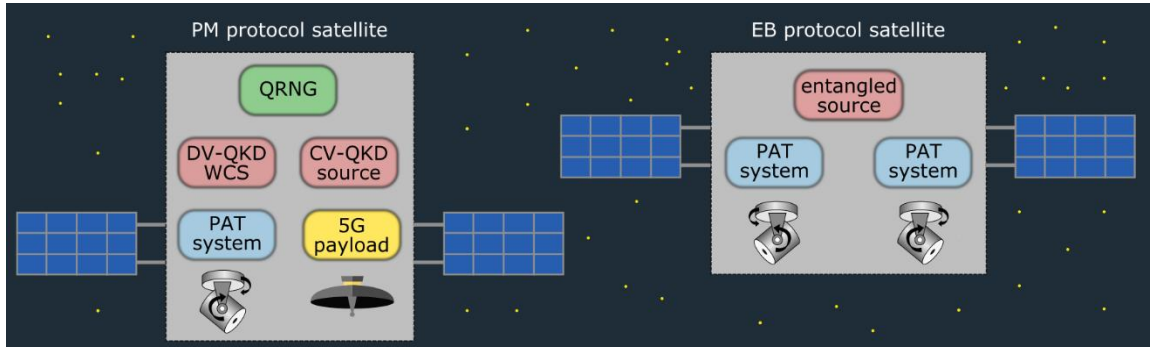
QUDICE
QUantum Devices and subsystems for Communications in spacE

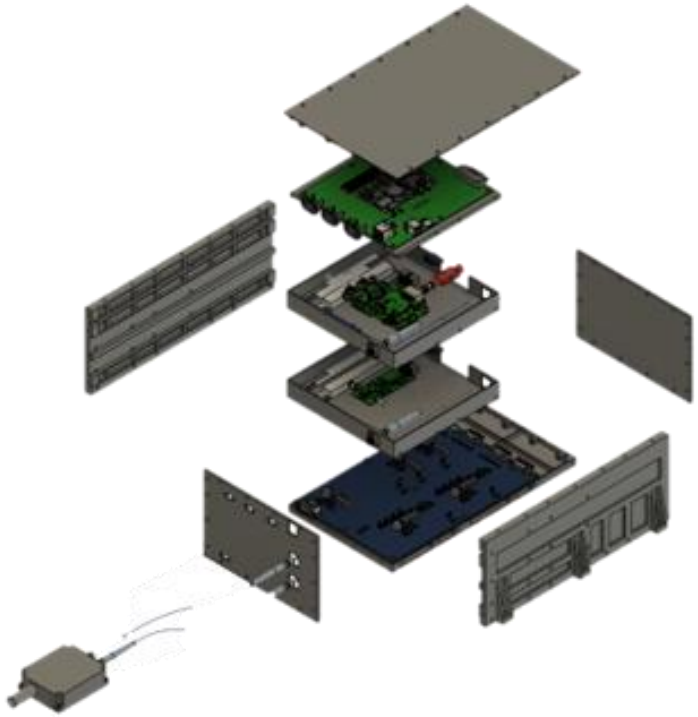
esa
European Space Agency

ESA, EC, ASI, …

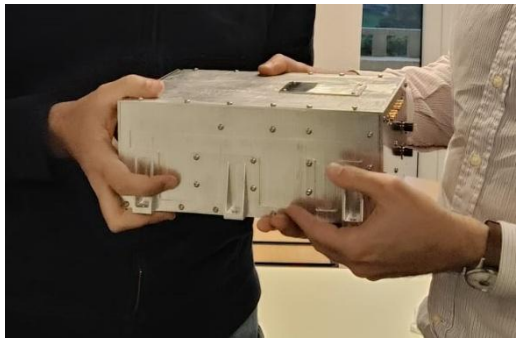
Space-grade Quantum Source (Prepare & Measure, EB,...)







Development of space-qualified (TRL6) Engineering Model of DV-QKD source



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