

## Press Release

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# QUANTUM TECHNOLOGIES MADE IN AUSTRIA - AIT COORDINATES PILOT PROJECT OF THE EUROPEAN QUANTUM COMMUNICATION INITIATIVE QCI

AIT is Austria's centre of excellence for quantum technology and drives key implementation initiatives for a secure networked Europe

Magnus Brunner, State Secretary at the Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK), signed the "EuroQCI Declaration" on behalf of Austria in Brussels at the end of February 2020. With the signing of this European Quantum Communication Infrastructure Initiative, 24 EU member states have now confirmed their intention to establish a European cyber shield based on a quantum communication infrastructure within the next 10 years. Under the title "Open European Quantum Key Distribution Testbed" (OPENQKD), the AIT Austrian Institute of Technology, Austria's largest research organisation for applied research, has already been leading the first European pilot project within the framework of the EuroQCI initiative since September 2019, which deals with the realisation of a secure networked Europe through quantum encryption.

In this context, the know-how gathered in many years of research at the AIT will also flow centrally into the first European study "QCI4EU", which will be launched in February 2020. The aim of this study is to specify the user requirements and use cases that will drive the development of EuroQCI in close cooperation with the participating member states. Based on this, an overarching system architecture for EuroQCI will be elaborated, consisting of space-based and terrestrial solutions that are "secure by design" and cover the entire European Union. The goal of EuroQCI is to enable the transmission and storage of information and data in an ultra-secure manner and to interconnect critical public communications across the Union.

Over the past decade, AIT has gained an excellent international reputation as a specialist in quantum technologies and as a coordinator of major European projects. This has also been demonstrated, for example, in the highly competitive European **Quantum Flagship** programme, which aims to develop quantum technologies for the mass market.

### **OPENQKD: Secure networked Europe through quantum encryption**

In September 2019, the EU launched the €15 million Horizon 2020 project "**OPENQKD**", which was scheduled for 3 years and the results will feed into the EuroQCI initiative. The consortium led by the AIT comprises 38 partners from 9 member states of the European Union, UK, Switzerland, Bosnia and Herzegovina and Israel and covers a very broad field of expertise with its composition of manufacturers, network operators, system integrators, SMEs, research institutions, universities, certification and standardisation bodies and end users. With the aim of establishing a secure network for quantum communication in Europe and thus launching a European ecosystem for quantum technology providers and application developers, the development of various

demonstrators and future applications is being driven forward. This includes, for example, secure data traffic over telecommunication networks as well as corresponding storage in cloud infrastructures, the protection of sensitive medical information or data of public authority communication as well as a secure transmission of control and steering signals during the operation of critical infrastructure (telecommunication networks, energy supply). In this way, the digital European data economy is to be secured against current and future threat scenarios (e.g. through quantum computers) and thus the strategic autonomy of Europe in the digital age. Further information can be found here: <https://www.openqkd.eu/>

### **"Quantum Flagship projects UNIQORN and CiVIQ**

The "**Quantum Flagship**" programme is one of the largest initiatives of the European Commission and was launched in 2018 with a timeframe of 10 years and a funding volume of €1 billion. Its goals include developing a competitive European quantum technology industry and establishing Europe as a dynamic and attractive region for quantum research.

With the **UNIQORN** project (Affordable Quantum Communication for Everyone: Revolutionizing the Quantum Ecosystem from Fabrication to Application), the AIT is leading innovative user-oriented pioneering research with 17 partners from Europe to initiate a miniaturisation of quantum applications in the direction of system-on-chip solutions through the use of photonic technologies. The aim is to make quantum technology available to the general public in a cost-optimised manner. In particular, the project will provide important impulses and breakthroughs for the generation of true random numbers (and thus highly secure key distribution) with the realisation of specialised quantum optical sources, miniaturised QKD transmitter units and detector technology on production platforms suitable for mass production. Further information: <https://quantum-uniqorn.eu/aktuelle-news/>

The **CiVIQ** project focuses on the cost-effective integration of quantum communication technologies into emerging optical telecommunications networks. A total of 21 partners, including leading telecoms, integrators and QKD developers, are working on state-of-the-art flexible and cost-effective quantum key distribution (QKD) systems and new quantum cryptographic systems and protocols. In the future, consumers, industry and institutions should be able to be offered innovative services that meet the needs of a secure telecommunications market. In this project, AIT is developing QKD prototypes and specialised software for field use. Further information: <https://civiquantum.eu/>

### **QUARTZ: Quantum encryption via satellites**

Since 2018, AIT has also been significantly involved in the consortium coordinated by SES, the world's leading satellite operator, to develop a satellite-based cybersecurity system based on quantum encryption. The QUARTZ (Quantum Cryptography Telecommunication System) project is supported by the European Space Agency ESA. In addition to the AIT and the project coordinator SES, the QUARTZ consortium also includes 8 other renowned research institutions, universities and companies. Together, they will work until 2021 to design the distribution of secure keys between optical terrestrial ground stations, all of which are connected to a quantum satellite via quantum links, and to develop initial software and hardware components. This is because unlimited satellite coverage will make it possible to overcome the current limitations of fibre-optic-based QKD

systems with transmission ranges of a few hundred kilometres and make a globally available cybersecurity system available even for networks in remote regions. Further information via this link: <https://www.ait.ac.at/quartz>

#### Special note on data protection and privacy at the AIT Austrian Institute of Technology

The protection of data and privacy are essential for a modern society. They form the fundamental basis of trust for cultural, social and economic development. The associated creation of "security" is therefore a key core task at the AIT Austrian Institute of Technology. Against the backdrop of diverse, constantly changing threats to our society, it is important to develop innovative approaches to countering these threats. A particular focus of research activities at the AIT is therefore on methods, architectures and technologies in order to fundamentally consider and incorporate the highest possible level of data protection in any technical solution through privacy by design approaches. Data protection and privacy are sensitive and worthy of protection, which is taken into account as a top priority in all research activities conducted at the AIT.

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