



Press release

Start-up Quantum Optics Jena (QOJ) presents for the first time live quantum encryption at the Leipzig data center

Ultra-secure data transmission at the Leipzig Internet network node successfully demonstrated to an expert audience

Jena, November 25, 2024 - The start-up Quantum Optics Jena (QOJ) demonstrated its tap-proof quantum encryption in front of an expert audience on November 19, 2024, together with the regional network operator and telecommunications service provider envia TEL. This was uncharted territory for QOJ and envia TEL: it was the first time that a quantum technology provider and a DE-CIX node had worked together in Germany to demonstrate quantum cryptography live in action.

In front of 30 invited guests from industry, research and federal and state institutions, QOJ demonstrated the transmission of quantum states over a 60-kilometer fiber link between two envia TEL sites. The generation, transmission and use of quantum keys for tap-proof encryption of digital information was demonstrated. A VPN connection was used for this purpose, which reconfigured itself with a new quantum key every minute. The keys were generated and transmitted in real time. The use of digital keys in a High Security Module (HSM), which can store and manage quantum key material, for example in critical infrastructures (KRITIS), was also demonstrated.

Technology has grown out of the lab

With this demonstration, QOJ and envia TEL have proven that quantum cryptography can be used in real infrastructures - and not just under laboratory conditions. In quantum cryptography, digital keys are generated by individual particles of light (quanta); these are secured by the fact that any attempt to view them from outside measures the quantum properties and can no longer be sent in an identical state. This allows attackers to be specifically identified. The audience experienced the generation of the entangled light particles through to the detection and derivation of secure key material and the use of the key material in a VPN network (Virtual Private Network).

Kevin Füchsel, CEO at QOJ, was delighted with the successful demonstration: "We have proven that quantum encryption is now ready for production. Together with our partner envia TEL, we were able to demonstrate the application under real conditions at a German internet node." Dirk Schüppel, Head of Corporate Development / Digitalization at envia TEL, adds: "Quantum encryption will revolutionize the technologies currently in use and enable tap-proof communication. We are delighted to be one of the first telecommunications companies to support Quantum Optics Jena in the introduction and implementation of this pioneering technology in Central Germany."



QOJ and envia TEL also used the presentation to gather feedback and comments from potential or future users and incorporate this into the next product generation: After all, the aim is to provide ready-to-use solutions for quantum-safe communication in collaboration with other technology partners in the coming months. Interested parties are expressly invited to contact QOJ or envia TEL.

Quantum Optics Jena on course for global expansion

QOJ closed a second financing round in September 2024 with 8.5 million euros. QOJ is currently the world's only commercial provider of multi-party quantum key distribution systems. The company develops hardware, software and services for data exchange and has already won several awards. Headquartered in Jena, QOJ is already a global player and is active in Singapore, Spain, Austria and Slovakia. There is also a sales office in North Carolina in the USA. The company is currently working on networking data centers and critical infrastructures. In rural areas, a communication system is being set up with partners around the city and university town of Jena to enable information and patient data to be sent securely to Jena University Hospital. QOJ is also involved in the development of a European quantum communication infrastructure, EuroQCI for short. It should be operational throughout Europe by 2027.

About QOJ

Quantum Optics Jena was spun off from the Fraunhofer Institute for Applied Optics and Precision Engineering (IOF) in Jena in 2020. The managing directors are Dr. Kevin Füchsel and Dr. Oliver de Vries. A few months after Alain Aspect, John F. Clauser and Anton Zeilinger, whose research made a significant contribution to the understanding of entanglement, were awarded the Nobel Prize in Physics, Quantum Optics Jena launched its first commercial solutions on the market. More about Quantum Optics Jena at www.qo-jena.com.

About envia TEL

envia TEL GmbH (envia TEL), based in Markkleeberg, is the leading regional telecommunications service provider and network operator in Central Germany. The company offers products and services across the entire spectrum of telecommunications, services for network operators and cyber security solutions. With the Datacenter Campus Leipzig, envia TEL operates one of the most modern data center locations in Europe and offers 3,000 square meters of space for 60,000 servers. The campus has been home to the regional internet exchange DE-CIX Leipzig since 2022. Based on a fiber optic network of around 7,000 kilometers, envia TEL reaches 40,000 companies in around 350 business parks and 100,000 private households in the region. As a wholly-owned subsidiary of envia Mitteldeutsche Energie AG (enviaM), the company employs more than 200 people in Chemnitz, Cottbus, Halle, Markkleeberg and Taucha.

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