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"Quantum Optics Jena": Fraunhofer IOF technology start-up successfully completes seed funding to develop high-security communication systems

Jena | Becoming a pioneer company for high-security quantum communication – nothing less is the goal of "Quantum Optics Jena GmbH". The latest spin-off at the Fraunhofer Institute for Applied Optics and Precision Engineering IOF develops quantum-based solutions for state-of-the-art communication systems. Now the founding team has gathered the necessary investors behind them and is working on building up the start-up in the heart of Germany.

Digital information and communication are integral parts of everyday life and elementary for society and the economy. Computers, optical fiber networks and satellite links now connect entire continents and form the basis of the global communications infrastructure. Today, the security and sovereignty of data is secured by complex mathematical algorithms and cryptography solutions. With the highly dynamic development of quantum computing, completely new types of computing power are becoming possible, posing a threat to classical encryption methods.

Quantum physics also provides the answer to this challenge: Based on physical laws, quantum optics enables completely new concepts for generating encryption methods and the physically secure transmission of information. Here, the secure key for the encryption and exchange of information is performed by quantum physical methods. This quantum key distribution (QKD) enables the physically measurable secure exchange of information.

Know-how from the Fraunhofer IOF

The start-up "Quantum Optics Jena" (QOJ) is a spin-off of the Fraunhofer Institute for Applied Optics and Precision Engineering IOF, which has already been successfully active in the field of quantum communication and quantum imaging for several years.

"In recent years, we have been able to demonstrate technological readiness for entangled photon sources at the Fraunhofer IOF, and as Quantum Optics Jena we are now combining the natural laws of quantum mechanics with expertise in the development and production of optical systems to offer socially exploitable solutions," explains Dr. Oliver de Vries, CTO of the Thuringian start-up. "Our goal is to establish a pioneering company for tap-proof communication in information technology in the heart of Germany," adds CEO Dr. Kevin Fücksel.

Prof. Andreas Tünnermann, director of the Fraunhofer IOF, also welcomes the entrepreneurial step of the former employees: "Quantum technology is one of the most

Editorial Notes

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groundbreaking research and development fields of our time. I am pleased to see how young founders transfer their knowledge gained at Fraunhofer IOF into their own companies and thus into new innovations."

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Rapid development of the start-up with the investors

The investors are convinced of the idea: The triumvirate of ELAS Technologies GmbH, Fraunhofer Technologie-Transfer Fonds GmbH and beteiligungsmangement Thüringen (bm|t) believes in the future of quantum technologies and invests a seven-digit amount in "Quantum Optics Jena GmbH". "We are pleased to have put together an outstanding team of investors for Quantum Optics Jena in recent weeks. Now the company has the necessary clout to build up and quickly implement their ideas," comments Matthias Keckl from Fraunhofer Technologie-Transfer Fonds.

First products in preparation

In the coming weeks, the team will work intensively on the realization of its first own product: a compact and high-performance entangled photon source for quantum key distribution or quantum optical experiments. Dr. Oliver de Vries elaborates: "In the next step we will be able to provide our customers with complete QKD systems to counter cyber-attacks and the threat of quantum computing."

But that's not all: The QOJ team continues to work closely with Fraunhofer IOF and is currently tinkering with a new product for quantum imaging, which could soon find application in medical technology or materials analysis.

Involved partners***Fraunhofer IOF***

The Fraunhofer Institute for Applied Optics and Precision Engineering IOF, based in Jena, Germany, conducts research into the further development of light as a means of solving a wide variety of problems and application scenarios. The work of the research institute, founded in 1992, therefore focuses on application-oriented research into light generation, light guidance, and light measurement. Together with researchers from basic research and industry, innovative solutions are created that represent a technological advantage in science and industry and open up new fields of application for photonics.

Beteiligungsmangement Thüringen (bm|t)

Erfurt-based, bm|t beteiligungsmangement Thüringen – a subsidiary of the Thüringen Development Bank, is the first address for Venture Capital and Private Equity investments in Thüringen, Germany. bm|t currently manages ten investment funds with a total volume of 440 million euros. bm|t invests in innovative companies with strong growth potential across all sectors and all phases of the corporate lifecycle.

Fraunhofer Technologie-Transfer Fonds GmbH (FTTF)

The Fraunhofer Technology Transfer Fund is a venture capital fund with a volume of 60 million euros that provides start-ups with Fraunhofer technologies with capital of 250,000 to 5 million euros in the challenging early phases. Supported by the European Investment Fund (EIF) and the Fraunhofer-Gesellschaft, the FTTF stands by founding teams as an entrepreneurial partner.

ELAS Technologies GmbH (ELAS)

ELAS Technology Investment GmbH is a German-based but globally oriented financial investor, with Headquarters in Achim in the north of Germany. ELAS has been created to provide financial agility and infrastructure support for promising entities and organizations in the globally favorable photonic and high-tech industries. German industry's own record and competences in these technology areas is of course second to none.

Further information

www.go-jena.com

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Fig. 1: The first products of "Quantum Optics Jena" are already in preparation. These include a miniaturized entangled photon source with more than one million entangled photon pairs at 780 nm and 840 nm wavelengths. (Copyright: Quantum Optics Jena)

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