

FRAUNHOFER-INSTITUTE FOR APPLIED OPTICS AND PRECISION ENGINEERING IOF

PRESS RELEASE

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New research alliance QUANTIFISENS launched

State-of-the-art sensor technology based on fiber optic and quantum methods

Jena (Germany)

The German Federal Ministry of Education and Research (BMBF) is funding a new regional research alliance in Thuringia with approximately twelve million euros: QUANTIFISENS. The aim is to develop an innovative sensor platform based on fiber-optic and quantum technology processes. The Free State of Thuringia will thus be further strengthened to become the leading center for special optical fiber technologies. With a kickoff on September 27 in Jena QUANTIFISENS has now entered its three-year research phase.

What do an operating room and a construction site have in common? In the future, perhaps quite a lot, because the partners in the new QUANTIFISENS research alliance are working to ensure that both will soon be using highly efficient fiber- and quantum-based sensors. On the operating table, for example, to detect cancer on the spot without having to wait for long pathological detours. On construction sites, for example when building tunnels, self-learning fiber sensor systems integrated into the building structure can, among other things, monitor heat development and thus warn of fire hazards. Vibrations can also be detected, and a possible collapse can thus be prevented.

The development of such sensor systems is the goal of the new research alliance: QUANTIFISENS stands for omnifunctional, quantum-inspired fiber sensor systems and describes a novel, holistic approach to solving complex, sensor problems with the help of optical fibers, the relevant measurement technology and innovative self-learning software. With the slogan “the sensing [r]evolution”, the alliance aims to initiate a turning point in the evolutionary development of classical sensors and even revolutionize them using quantum technologies.

Regional alliance of 13 partners

A total of eleven companies and two research institutions are members of the regional alliance. The combination of the partners, the majority of which are located in the high-tech optics region of Jena in Thuringia – consisting of highly innovative, agile, small companies and established, production-experienced market participants as well as research institutions – results in efficient connections. With QUANTIFISENS, Thuringia presents itself as a modern, innovative, and dynamic player in the sector of state-of-the-

Editorial Notes

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art sensor technology. The project aims to ensure sustainable growth for the companies by maintaining existing jobs and creating new ones.

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Prof. Dr. Andreas Tünnermann, director of Fraunhofer IOF, is therefore looking forward to the upcoming research work: "The increasing demands on accuracy and drift stability of sensor systems require a technological leap towards quantum sensor technology in the near future. QUANTIFISENS will make a significant contribution and, with the development of a system-agile platform of fiber-optic technologies, quantum-inspired processes and new software in the targeted depth of added value, will be a unique selling point for the region worldwide."

Funding under the RUBIN program

QUANTIFISENS is being funded by the BMBF as part of the RUBIN program (Regionale Unternehmerische Bündnisse für Innovation, in English: "Regional Entrepreneurial Alliances for Innovation") with approximately twelve million euros. Just under four million of this will flow into research at the Fraunhofer Institute for Applied Optics and Precision Engineering IOF. "In particular, Fraunhofer IOF is contributing its expertise in fiber, laser, and quantum technologies as well as scattering-based metrology and system integration," explains Dr. Thomas Schreiber, responsible spokesman for research issues of the alliance and head of department at the Fraunhofer Institute. "The plan is to develop an omnifunctional fiber technology to improve the sensing properties of fibers and to generate special wavelengths. In addition, these will be realized together with tailored laser systems to improve resolution in distributed fiber sensing as well as novel sources and concepts for quantum imaging fiber sensing endoscopy."

A further approx. 5.5 million euros of the total budget will be financed proportionally by the participating industrial partners themselves.

The QUANTIFISENS alliance partners

The partners in the alliance already cover the entire value chain: They include material manufacturers, fiber technologists, coating and structuring experts as well as system integrators. Thanks to its exclusive know-how, the alliance thus has the optimal prerequisites for successfully creating disruptive innovations and to make the sensor technology platform ready for the market.

The QUANTIFISENS alliance includes the following partners: ADVA Optical Networking SE, Active Fiber Systems GmbH, Batix Software GmbH, epicinsights c/o SMA Dev. GmbH, FBGS Technologies GmbH, Fraunhofer Institute for Applied Optics and Precision Engineering IOF, GRINTECH GmbH, heracle GmbH, Leibniz Institute for Photonic Technologies, LASOS Lasertechnik GmbH, Luna Innovations Germany, PreciPoint Innovation GmbH, Quantum Optics Jena GmbH.



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The joint coordinator of the industry-driven development project is FBGS Technologies GmbH.

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Further information

Website of the QUANTIFISENS alliance: <https://quantifisens.com/>

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Press Photos

The following press photos are available for download in printable resolution in the [press area of Fraunhofer IOF](#):

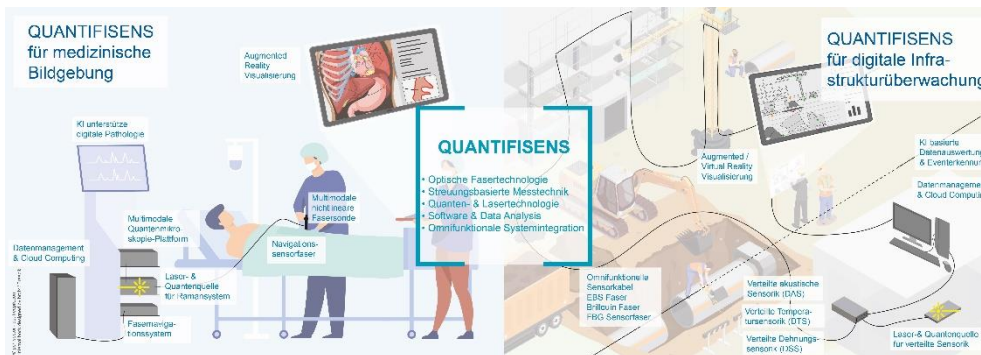


Fig. 1: State-of-the-art fiber probes will be used in medical imaging as well as for monitoring digital infrastructures. (Schematic representation in German) © FBGS Technologies GmbH



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About Fraunhofer IOF

Light is a versatile tool. Due to its diverse applications as well as excellent properties as an electromagnetic wave and as a light particle, it is a key technology for future challenges of the modern world.

With this in mind, the Fraunhofer Institute for Applied Optics and Precision Engineering IOF, based in Jena, Germany, conducts research on the development of light as a means of solving a wide variety of problems and application scenarios. The work of the institute, founded in 1992, focuses on applied research in light generation, light guidance, and light measurement.

The interdisciplinary pooling of the institute's own expertise in the fields of optics and precision engineering allows Fraunhofer IOF and its cooperating partner organizations to develop complex and unique photonic components and systems. 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.

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The **Fraunhofer-Gesellschaft**, headquartered in Germany, is the world's leading applied research organization. With its focus on developing key technologies that are vital for the future and enabling the commercial exploitation of this work by business and industry, Fraunhofer plays a central role in the innovation process. As a pioneer and catalyst for groundbreaking developments and scientific excellence, Fraunhofer helps shape society now and in the future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research institutions throughout Germany. The majority of the organization's 30,000 employees are qualified scientists and engineers, who work with an annual research budget of 2.9 billion euros. Of this sum, 2.4 billion euros is generated through contract research.