PRESS RELEASE

Fraunhofer and QuTech unite to champion quantum internet

The Fraunhofer-Gesellschaft and the Dutch research center QuTech—a collaboration of TU Delft and TNO—are joining forces in the fields of quantum communication and quantum information networks. Together, they are positioning themselves as leading organizations for the development and transfer of quantum technologies to strengthen Europe's innovative power and pave the way for the quantum internet. Today, the partners have signed a memorandum of understanding for close cooperation.

In a long-term, strategic partnership, the Fraunhofer-Gesellschaft and QuTech will work together structurally on the development and knowledge transfer of the quantum internet. The partners aim to initiate and promote a wider scientific collaboration, to roll out new prototypes and testbeds, and to make better joint use of know-how in application-oriented research and transfer to industry.

"To ensure reliable and secure communication and to strengthen European sovereignty in the field of new quantum technologies, we are committed to the goal of establishing a multinational quantum network in the EU," explains Paul de Krom, CEO of TNO. The network will be made available to industry and science as a testbed to develop new products and applications and to unlock the full potential of distributed quantum computing. To this end, the participants will jointly establish technology and interface standards in the areas of quantum communication and quantum information networks and to contribute in a coordinated manner to European agenda setting in these areas.

For example, QuTech and Fraunhofer have agreed to collaborate on the deployment of complex quantum key distribution (QKD) networks across borders or around hubs in Germany and The Netherlands. They will also collaborate to develop integrated photonics solutions for such networks.

Pan-European quantum network

"To become a world leader in the implementation and application of new quantum technologies and to remain competitive against the market powers USA and China, immense joint transnational efforts of European science, industry and society are necessary," says Prof. Reimund Neugebauer, President of the Fraunhofer-Gesellschaft.

Press contact
Roman Möhlmann | Fraunhofer-Gesellschaft München | Communications | Telephone +49 89 1205-1333
presse@zv.fraunhofer.de | www.fraunhofer.de
Jonas van Bebber M.Sc. | Fraunhofer Institute for Laser Technology ILT | Group Communications | Telephone +49 241 8906-8007
jonas.van.bebber@ilt.fraunhofer.de | www.ilt.fraunhofer.de

The near future holds many challenges and opportunities for cooperation. For example, further tenders for European quantum communication infrastructures in cross-border quantum networks can be expected bolstering Europe's leadership and sovereignty on these important technologies. "These collaboration infrastructures require a cross-border strategy between leading countries and actors for the development of the various technologies and a clear understanding of the different positions, roles, and interests," explains Dr. Kees Eijkel, Director of Business Development at QuTech.

Combining inventive and entrepreneurial spirit

Since 2019, the Fraunhofer Institute for Laser Technology ILT and QuTech have been working closely together as part of an ICON project, a Fraunhofer program for cooperation with excellent international partners, to develop optical components for quantum communication and information. The benefits of the fruitful collaboration are already reflected in a quantum frequency converter (QFC) architecture recently demonstrated by Fraunhofer ILT with record performance in terms of low noise and improved signal-to-noise ratio.

With the memorandum of understanding, the previous cooperation agreement will now be expanded and placed on a broader basis with the entire expertise of the Fraunhofer-Gesellschaft. In addition, both parties plan to install the first German quantum node of a transnational quantum network at Fraunhofer ILT as an extension and testbed, and as stepping stone for an European approach to an entanglement-based quantum internet. The basis for this will be the QuTech technology as well as the Fraunhofer ILT QFC technology. Prof. Constantin Häfner, Director of the Fraunhofer ILT, concludes: "Close, cross-national collaboration is an essential building block for the joint development of an innovation ecosystem for quantum technologies, for technology transfer and—in collaboration with RWTH Aachen University—for the transfer of talent to industry to strengthen European competitiveness in global markets. "

The memorandum of understanding was signed on December 14, 2021 by Prof. Reimund Neugebauer, Paul de Krom, Dr. Kees Eijkel and Prof. Constantin Häfner. The bi-national partnership is a preamble for pan-European collaboration.

More information:

- More information on complex QKD networks on the QuTech website
- More information on the Fraunhofer ICON project "QFC-4-1QID"
- Website Fraunhofer Competence Network Quantum Computing

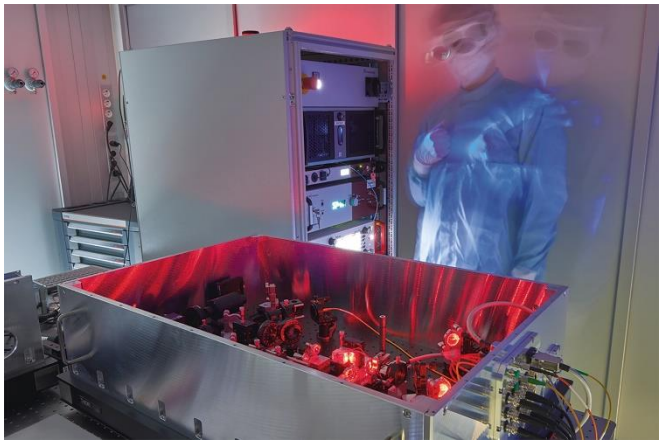

Image 1:
Fraunhofer and QuTech jointly strengthen Europe's innovative power and develop new technologies for quantum communication and quantum information networks. Shown here: laboratory prototype for a low-noise quantum frequency converter.
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About QuTech

QuTech is a mission-driven research institute of Delft University of Technology (TU Delft) and the Netherlands Organisation for Applied Scientific Research (TNO). Together, they are working on a radically new technology with world-changing potential. The mission: to develop scalable prototypes of a quantum computer and an inherently safe quantum internet, based on the fundamental laws of quantum mechanics. To address this challenge, they bring together scientists, engineers and industry in an inspiring environment.

About Fraunhofer

The Fraunhofer-Gesellschaft is the leading organization for applied research in Europe. Its research activities are conducted by 75 institutes and research institutions at locations throughout Germany. International collaboration with outstanding research partners and companies from around the world brings Fraunhofer into direct contact with the key regions that drive scientific progress and economic development.

About Fraunhofer ILT

The Fraunhofer Institute for Laser Technology ILT is worldwide one of the most important development and contract research institutes of its specific field. The activities cover a wide range of areas such as the development of new laser beam sources and components, precise laser-based metrology, testing technology, quantum technology and industrial laser processes.

Contact

Dr. Bernd Jungbluth
Head Strategic Program Quantum Technology
Telephone +49 241 8906-414
bernd.jungbluth@ilt.fraunhofer.de

Fraunhofer Institute for Laser Technology ILT
Steinbachstraße 15
52074 Aachen, Germany
www.ilt.fraunhofer.de

Dr. Kees Eijkel
Director Business Development QuTech
Telephone +31 6 222 35456
c.j.m.eijkel@tudelft.nl

QuTech
Lorentzweg 1
2628 CJ Delft, Netherlands
https://qutech.nl/