

Dutch-German Cooperation to champion quantum internet: Fraunhofer and QuTech signed memorandum of understanding

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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. On December 14, 2021 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.

Paul de Krom, CEO of TNO, explains:

"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."

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.

Prof. Reimund Neugebauer, President of the Fraunhofer-Gesellschaft, says:

"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."

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. Dr. Kees Eijkel, Director of Business Development at QuTech, explains:

"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."

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. The bi-national partnership is a preamble for pan-European collaboration. 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.”

Source: Fraunhofer Institute for Laser Technology ILT/ IDW Nachrichten

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