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QUANTisch for beginners

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Deutsches Museum

*In the joint project QUANTA, the Deutsches Museum along with the Fraunhofer Institute for Systems and Innovation Research ISI, the Munich Centre for Quantum Science and Technology (MCQST), the PhotonLab at the Max Planck Institute of Quantum Optics (MPQ), the TUM School of Education and IQM Finland Oy (IQM) are developing new ways and means to make the basic principles, opportunities and uses of quantum technology accessible to a wider audience.*

Intuitively – is the keyword for the way in which quantum technology should be made approachable for everyone. For this reason, the Federal Ministry of Education and Research (BMBF) set up the support initiative “Quantum active-intuitive outreach concept for quantum technology”. Projects being supported through this initiative include QUANTA, the joint project of Deutsches Museum, the Fraunhofer Institute for Systems and Innovation Research ISI, the Munich Centre for Quantum Science and Technology (MCQST), the PhotonLab at the Max Planck Institute of Quantum Optics (MPQ), the TUM School of Education and IQM Finland Oy (IQM).

Under the heading “QUANTisch für AnfängerInnen”, (QUANTish for beginners), the QUANTA partners are developing and testing a set of exhibition elements, dialogue events, and game-based learning activities which make it possible to experience qubits, superposition and entanglement.

The Deutsche Museum’s report director of exhibitions and collections, Andreas Gundelwein, says, that absolute experts from the fields of research and mediation are working together on this project.

In this way, the Fraunhofer ISI contributes decades of experience in design scenarios and the development and implementation of futures dialogs with various social groups. As a QUANTA partner, the Fraunhofer ISI supports the mediation of knowledge about quantum technology through workshops and dialogues with teenagers and experts.

Simone Kimpeler, project leader at the Fraunhofer ISI, explained that the aim of events held in the Future Museum and the PhotonLab, is to motivate teenagers and those interested, to become creatively involved with the possible applications of Quantum technology in everyday life. She stressed the importance of joint development of ideas for the uses of Quantum technology and actively involving teenagers in Technology Design.

The Cluster of Excellence MCQST and the PhotonLab of the MPQ possess exceptional experience in didactic programmes in the field of quantum physics. Tatjana Wilk, general manager of MCQST explained that their scientists regularly take part in public events and present their current research to the general public and therefore have already developed concepts and methods which help making quantum phenomena easier to understand.

Based on these ideas the PhotonLab is now developing prototypes for Hands-On-Models which illustrate the basic concepts of quantum physics. Topics such as superposition, entanglement and qubits should form the basis in understanding, for example, quantum computers. The PhotonLab is a school laboratory for optics and photonics at the Max-Planck-Institute für Quantenoptik in Garching. Silke Stähler-Schöpf, the laboratory manager of the PhotonLab, says it provides the ideal interface between school and science, where scientists can give expert input to the development of models and the students can test them and contribute to making improvements. This means that part of QUANTA's target group can be directly involved in the development process.

The TUM School of Education contributes its extensive expertise in training physics teachers and sharing new knowledge in science and technology.

Andreas Kratzer from the TUM points out that the teaching of quantum theory is a special educational challenge, where understanding requires a major change in the physical worldview and that new developments in quantum technology are increasingly enabling quantum technology to penetrate areas of our lives. The QUANTA project will also highlight the social impact generated by quantum technology and open new didactic methods, he says.

IQM provides a cut away model of a prototype quantum computer, which will be on display in the Nuremberg branch of the Deutsches Museum. IQM scientists will also take part in the planned futures dialogues.

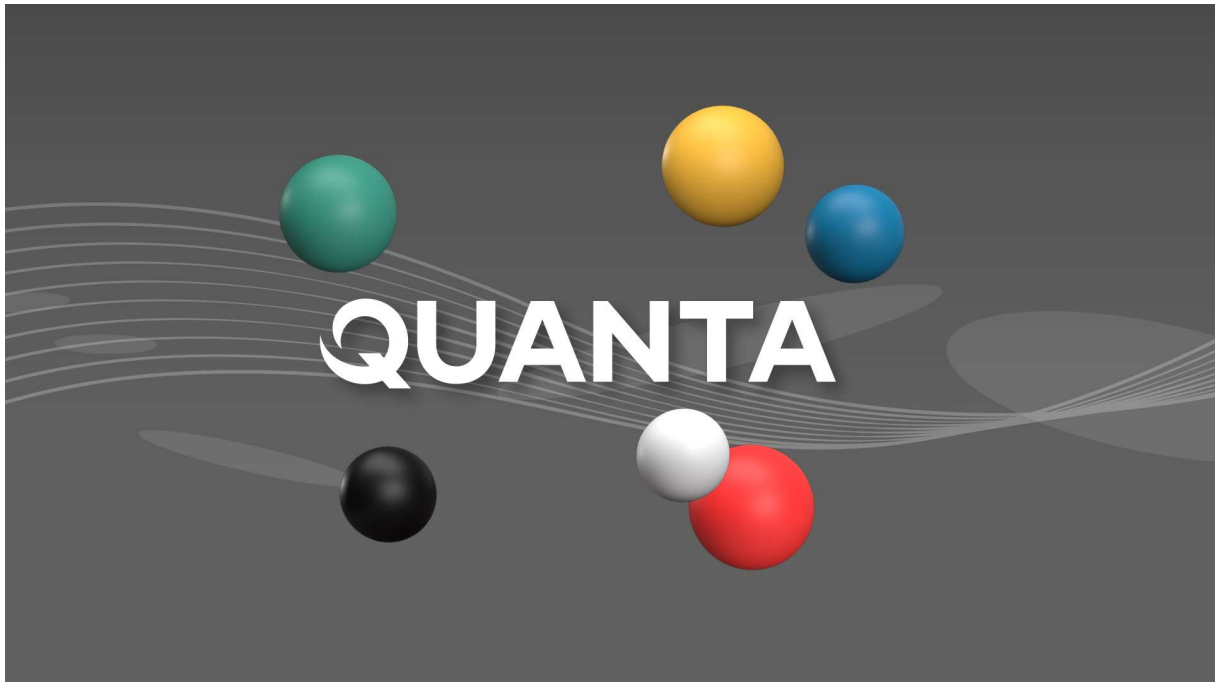
IQM's marketing manager, Stefan Rank, says, that IQM developed a world leading quantum-computer based on superconducting qubits. A special characteristic of superconducting qubits is the macroscopic control of quantum systems. IQM is pleased to provide the quantum computer for exhibition in the Deutsches Museum as part of the QUANTA joint project to enable a wide audience access to this technology.

In addition, the Deutsches Museum is the place where a new format will come into place and be tested. The main site and its branches are leading in the mediation of the latest technology. Gabriele Kramer, leader of the project in the Deutsches Museum says, that as the most visited museum in Germany, the Deutsches Museum is in the best position to reach the target groups.

At the Museumsinsel in Munich and in the new Zukunftsmuseum in Nuremberg, amongst other things, there are plans to build an experiment station, a multimedia science show, workshops in the in-house laboratories and discussion events where for example scientists and researchers will speak with young adults about the possibilities and challenges of quantum technology. At the same time, didactic models will be developed, for example an app, which can be replicated or used at home or at school.

The project partners have been working closely together on concepts, models, formats, and stations for several weeks and the first event for the public at large is planned for the autumn of 2021.

Further information:



<https://www.quantentechnologien.de/forschung/foerderung/quantum-aktiv/quanta.htm...>

<http://www.deutsches-museum.de>

<http://www.isi.fraunhofer.de>

<https://www.mcqst.de/>

<https://www.mpq.mpg.de/>

<https://www.edu.tum.de/startseite/>

<https://meetqm.com/de/>