
A Quantum Computer for Europe: Joining Forces for New FET Flagship Project OpenSuperQ

Saarbrücken, 29.October 2018 –10 international partners from academia and industry will collaborate in a unique research endeavour to build a hybrid high-performance quantum computer. The new EU project OpenSuperQ (An Open Superconducting Quantum Computer), under the coordination of Saarland University, is part of the large-scale FET Flagship Initiative on Quantum Technologies. Out of the total budget of €1 billion for this unprecedented initiative, OpenSuperQ receives € 10.33 million and will run for an initial period of three years.

The world is currently taking the first steps into the second quantum revolution where quantum technologies will play a decisive part in advanced technology. In the last few years, quantum computing has been elevated from a basic research concept towards a viable cloud offering which will be affecting people's everyday lives in multiple ways. The collaborative research project OpenSuperQ aims at developing a quantum computing system of up to 100 qubits and to sustainably make it available at a central site for external users. The system consists of a full computing stack: The hardware will be based on superconducting integrated circuits and contain the necessary technological infrastructure, including a control system and user-friendly cryogenics. The software stack will be integrated from user access all the way to low-level control. While designed as an all-purpose quantum computer, the consortium particularly targets applications for quantum simulation in chemistry and materials science as well as for optimisation and machine learning. The computer will be among the leading platforms in the world and the first of its kind developed in Europe.

“We are fortunate to have gathered a team of the most renowned players in the field bringing together science, engineering and application development at the highest level,” said Prof. Wilhelm-Mauch from the Physics Department of Saarland University who coordinates the project. “A distinguishing and globally unique feature of OpenSuperQ is its open and integrative approach. We strongly believe that this approach will enable our system and its underlying technologies to serve a large community of early adopters of quantum technologies and educate the next generation of quantum scientists, developers and users. In addition, the planned sustainable central site at Forschungszentrum Jülich will certainly fuel the translation of technologies into applications.”

There are 2 partners from Switzerland in the consortium- ETH Zurich and Zurich Instruments AG. The Quantum Device Lab at the Department of Physics of ETH Zurich will contribute with its team of 30 researchers and staff to the success of OpenSuperQ with advances in quantum device design, fabrication and control of quantum systems. Prof. Andreas Wallraff states that “Our laboratory is looking forward to have a major impact with the first of its

kind, collaborative, publicly funded project OpenSuperQ aiming at realizing a European quantum computer based on superconducting circuits. We plan leverage the many fundamental contributions which our lab has made to the field in the past 10 years and bring the technology to the next level.”

Zurich Instruments AG takes responsibility for the quantum processor control system that executes the quantum algorithms and reads out the qubit states. Sadik Hafizovic, CEO and co-founder of Zurich Instruments AG says, "We are happy to contribute a pivotal part of the quantum computer. The OpenSuperQ project is an opportunity for Zurich Instruments AG to advance its global leadership in quantum computer control systems. The entire team at Zurich Instruments is looking forward to applying its know-how in quantum applications, signal processing and software engineering to this advance of the state of the art in quantum computing.“

The OpenSuperQ consortium targets a broad portfolio of tasks necessary for the development of quantum computers bringing together universities, research organisations, and technology companies. To maximise the project’s impact in the field, the partners strive to establish close links with European and international research and industry players both as technology partners and as users. The involvement of highly recognised stakeholders in the planned advisory board, the basic science group and a user board will further contribute to the achievement of this aim.

For more information, please visit <http://opensuperq.eu>

OpenSuperQ Partners

Germany:

- Universität des Saarlandes
- EURICE - European Research and Project Office GmbH
- Forschungszentrum Jülich GmbH

Spain:

- Universidad del País Vasco / Euskal Herriko Unibertsitatea

Sweden:

- Chalmers Tekniska Högskola AB
- Low Noise Factory AB

Switzerland:

- Eidgenössische Technische Hochschule Zürich
- Zurich Instruments AG

Finland:

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- Teknologian Tutkimuskeskus VTT Oy
 - BlueFors Cryogenics Oy

About the Quantum Flagship

The Quantum Flagship was launched in 2018 as one of the largest and most ambitious research initiatives of the European Union. With a budget of €1 billion and a duration of 10 years, the flagship brings together research institutions, academia, industry, enterprises, and policy makers, in a joint and collaborative initiative on an unprecedented scale. The main objective of the Flagship is to consolidate and expand European scientific leadership and excellence in this research area as well as to transfer quantum physics research from the lab to the market by means of commercial applications and disruptive technologies. With over 5,000 researchers from academia and industry involved in this initiative throughout its lifetime, it aims to create the next generation of disruptive technologies that will impact Europe's society, placing the region as a worldwide knowledge-based industry and technological leader in this field.

Contact

Project Coordinator:

Saarland University
Prof. Frank Wilhelm-Mauch
Phone: +49 681 302 3960
Mail: fwm@lusi.uni-sb.de

Project Management:

EURICE GmbH
Claudia Haase
Phone: +49 30 374415 839
Mail: c.haase@eurice.eu