Initiative for supporting Swiss Quantum Science and Technology

Quantum science and technology is a high-impact and strongly growing field with great potential to contribute profoundly to economic growth and society. There is rapid progress and increasing acceleration of quantum R&D in neighboring countries and across the world. Numerous national programs on an unprecedented scale have already started and are picking up speed. In contrast, the recent exclusion of Switzerland from the EU research programs is leading to a decline of funding and networking. Nevertheless, due to highly successful past programs, Switzerland is currently still very well prepared and positioned, hosting many leading groups as well as companies. This is creating a unique opportunity for a broad and sweeping quantum initiative in Switzerland. Therefore, the quantum community in Switzerland at large has gathered to discuss the future of this important area of research for Switzerland in the broadest sense.

We are convinced that it is now the right time to act swiftly to increase broad support to Quantum Science & Technology. The currently ongoing 2nd quantum revolution is exploiting *coherent superposition and entanglement* of individual quantum objects such as atoms, photons, electrons, and spins, opening the door for previously impossible capabilities, such as unprecedented sensitivity and enormous speedup of calculations. The main strategic areas of **quantum computing, simulation, materials, metrology/sensing and communication** are continuously fueled by **fundamental quantum research** and the development of supporting technologies including electronic and photonic **measurement and control technologies,** and **advanced materials**. The expected impact is going to be remarkable economic growth securing long term prosperity and broad and far reaching implications for society. First applications and commercial products are already available, with Swiss companies at the forefront of development (ID Quantique, Qnami, QZabre, Miraex, Orolia Spectratime, Ligentec, MicroR, Zurich Instruments…). This aligns perfectly well with the Swiss high-tech ecosystem of precision engineering and is an excellent match for the Swiss economy with many world-leading, high-tech SMEs. Projects often involve collaborations between Swiss academic institutions, RTOs and companies, providing a trained quantum workforce.

Since the immense potential is widely recognized, large investments are being made in the US, China, Japan, Australia, UK, and in the EU in France, Germany, Netherlands, Finland and other countries. For example, Germany launched a 2 billion EUR 5-year program in quantum technologies, representing roughly 0.5‰ of the German GDP. France's program is an even slightly larger fraction of their GDP. These are significant strategic investments, similar in scale to other countries. In contrast, Switzerland does not currently have such a large-scale initiative. Nevertheless, for more than 15 years, Switzerland has played a leading role in quantum technologies and is very well positioned as of today. Therefore, today, we are at a crossroads and have now the opportunity in our hands to create a new Swiss initiative in quantum science and technologies. This would allow Switzerland to affirm and expand on the leadership in quantum science and technology and to develop its quantum economy.

The Swiss quantum community would like to hereby unite and create a grassroots initiative to establish new **Swiss Quantum Programs**. We are ready to help shape its implementation and development where possible. A comprehensive program would broadly cover all strategic areas mentioned above, together with their basis of support, and comprise not only academic institutions but also RTOs and companies as well as the possibility for international collaboration. Importantly, technology transfer activities should help stimulate spin-offs and start-ups and help make companies quantum ready, creating a new quantum ecosystem and a rise of entrepreneurial spirit in Switzerland. In addition, investments into quantum infrastructure as well as quantum education would be very important. **The quantum science and technology community is ready to support the competitiveness of Switzerland in this critical domain and to ensure a leading position of its science and industry**.

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