

Quantum Technologies Flagship kicks off with first 20 projects

The Flagship will fund over 5,000 of Europe's leading quantum technologies researchers over the next ten years and aims to place Europe at the forefront of the second quantum revolution. Its long term vision is to develop in Europe a so-called quantum web, where quantum computers, simulators and sensors are interconnected via quantum communication networks. This will help kick-starting a competitive European quantum industry making research results available as commercial applications and disruptive technologies. The Flagship will initially fund [20 projects](#) with a total of €132 million via the [Horizon 2020 programme](#), and from 2021 onwards it is expected to fund a further 130 projects. Its total budget is expected to reach €1 billion, providing funding for the entire quantum value chain in Europe, from basic research to industrialisation, and bringing together researchers and the quantum technologies industry.

Andrus **Ansip**, Commission Vice-President for the Digital Single Market, said: *"Europe is determined to lead the development of quantum technologies worldwide. The Quantum Technologies Flagship project is part of our ambition to consolidate and expand Europe's scientific excellence. If we want to unlock the full potential of quantum technologies, we need to develop a solid industrial base making full use of our research."*

Mariya **Gabriel**, Commissioner for Digital Economy and Society, added: *"The Quantum Technologies Flagship will form a cornerstone of Europe's strategy to lead in the development of quantum technologies in the future. Quantum computing holds the promise of increasing computing speeds by orders of magnitude and Europe needs to pool its efforts in the ongoing race towards the first functional quantum computers."*

In the early 20th century, the first quantum revolution allowed scientists to understand and use basic quantum effects in devices, such as transistors and microprocessors, by manipulating and sensing individual particles.

The second quantum revolution will make it possible to use quantum effects to make major technological advances in many areas including computing, sensing and metrology, simulations, cryptography, and telecommunications. Benefits for citizens will ultimately include ultra-precise sensors for use in medicine, quantum-based communications, and Quantum Key Distribution (QKD) to improve the security of digital data. In the long term, quantum computing has the potential to solve computational problems that would take current supercomputers longer than the age of the universe. They will also be able to recognise patterns and train artificial intelligence systems.

Next steps

From October 2018 until September 2021, 20 projects will be funded by the Flagship under the coordination of the Commission. They will focus on four

application areas – quantum communication, quantum computing, quantum simulation, quantum metrology and sensing – as well as the basic science behind quantum technologies. More than one third of participants are industrial companies from a wide range of sectors, with a large share of SMEs.

Negotiations are ongoing between the European Parliament, Council and Commission to ensure that quantum research and development will be funded in the EU's multi-annual financial framework for 2021-2028. Quantum technologies will be supported by the proposed [Horizon Europe](#) programme for research and space applications, as well as the proposed [Digital Europe](#) programme, which will develop and reinforce Europe's strategic digital capacities, supporting the development of Europe's first quantum computers and their integration with classical [supercomputers](#), and of a pan-European quantum communication infrastructure.

Background

Since 1998, the Commission's Future and Emerging Technologies (FET) programme has provided around €550 million of funding for quantum research in Europe. The EU has also funded research on quantum technologies through the European Research Council (ERC). Only since 2007, the ERC has funded more than 250 research projects related to quantum technologies, worth some 450 million euro.

The Quantum Technologies Flagship is currently supported by [Horizon 2020](#) as part of the FET programme, which currently runs two other Flagships ([The Graphene Flagship](#) and [the Human Brain Project Flagship](#)). The FET programme promotes large-scale research initiatives to drive major scientific advances and turn them into tangible innovations creating benefits for the economy and society across Europe. Funding for the Flagship project comes from Horizon 2020, its successor programme [Horizon Europe](#) and national funding.

The Quantum Technologies Flagship is also a component of the Commission's [European Cloud Initiative](#) launched in April 2016, as part of a [series of measures](#) to support and link national initiatives for the digitisation of Europe's industry.

For more information

[Memo](#)

[The first 20 projects](#)

[Official website of the Quantum Flagship](#)

[Blog post by Vice-President Ansip on the Quantum Flagship](#)

[Joint statement on progress to build European supercomputers](#)

[European approach to Artificial Intelligence](#)