

Quantum technologies



Quantum technologies apply the principles of quantum mechanics, the physics of matter and energy at the smallest scales. They use these principles to build tools that work differently from the ones we use today. Quantum computers are the best-known application. Instead of the binary bits used by conventional computers, they use qubits. This allows them to tackle certain problems that would take today’s computers an impractical amount of time.

Large-scale, reliable quantum computers do not exist yet, but progress is moving quickly, with significant investment from both the public and private sectors.

Quantum technologies and law enforcement

For law enforcement, quantum technologies matter in two directions: they could create new opportunities for policing, but they could also lead to new risks. The potential is therefore not only about managing a future threat. It is also about understanding how quantum technologies could become useful tools for investigations and policing.

New risks

The EU Serious and Organised Crime Threat Assessment identifies quantum computing, alongside artificial intelligence and blockchain, as a technology that can act as a catalyst for serious and organised crime. In practice, it could increase the speed, reach and sophistication of criminal operations.

One of the most immediate concerns is encryption. Criminal networks are already collecting and storing encrypted data with the expectation that they will be able to decrypt it once computing power becomes sufficient. This approach is known as “harvest now, decrypt later”.

New opportunities

At the same time, quantum technologies could strengthen law enforcement capabilities. They could support new approaches to digital forensics, and make it possible to analyse large and complex datasets more efficiently.

How Europol is preparing

Europol is following these developments closely. The Europol Innovation Lab, together with the European Cybercrime Centre (EC3) and the European Commission’s Joint Research Centre, published The Second Quantum Revolution, the first assessment of what quantum computing and other quantum technologies could mean for law enforcement.

EC3 also hosts the secretariat of the Quantum Safe Financial Forum, a multi-stakeholder group bringing together banks, financial services providers and experts working on the transition to post-quantum cryptography. In 2025, the forum issued a call to action on the need to prepare for this transition. In addition, the Europol Innovation Lab is chairing the EuCB Strategic Group on Quantum Technologies, a network of law enforcement agencies working to prepare for and leverage emerging quantum developments.



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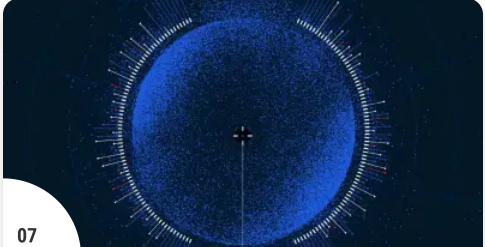
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Harvest now, decrypt later



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Quantum computing and cryptocurrencies

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