

Quantum technology for unhackable smartphones

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Fondazione Bruno Kessler, with the Q@TN laboratory and the QRANGE project, is at the forefront of the new quantum revolution

Despite its formal complexity and distance from our everyday perception, we use technologies developed on the basis of the quantum theory every day. Computers, smart phones, telecommunications equipment, laser, LED, optical fiber, and many other objects rely on it. The entire semiconductor industry which supplies chips for virtually every electrical device is a product of this revolution in physics.

If the quantum theory was one of the most important scientific advances of the twentieth century, today a new revolution is upon us where the ultimate principles of this theory are used to produce devices and innovative applications.

In this game, thanks to the [Quantum Flagship](#) and the establishment of the laboratory on quantum technologies, [Q@TN](#), the Trentino Region and Fondazione Bruno Kessler are strategically positioned to play an important role at national level. Quantum Flagship is one of the largest research and innovation initiatives in Europe that brings together scientists and engineers from academia and industry, as well as future users of quantum technologies, with the aim of consolidating and expanding European scientific leadership and excellence in this research field, launching a competitive European industry in quantum technologies and making Europe a dynamic and attractive area for research, business and innovative investments in this field.

In the next ten years, thanks to quantum technologies we will have unprecedented capacity and processing power, very high precision measurements for a wide range of applications both locally and in the cloud, the highest levels of data privacy and security in communications.

The work of the [QRANGE](#) project, an acronym for Quantum Random Number Generators, of which Fondazione Bruno Kessler is a part, focuses on the aspect of computer security, within the Flagship framework.

Let us try to explain how it works in a “simple” way. **Computer security** is based on the **generation of random numbers**. However, conventional technologies are not able to generate purely random numbers and so hackers manage to predict the results and enter users’

systems. This “problem” is solved by quantum technology and in particular by **quantum random number generators**, which use the perfect randomness of quantum objects to generate purely random numbers and therefore encrypted codes that are impossible to decrypt.

This [Euronews](#) video explains better what we are talking about:

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<https://magazine.fbk.eu/en/news/quantum-technology-for-unhackable-smartphones/>

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