

## That's why Europe is so strong in quantum technology

The development of powerful quantum computers is entering the decisive phase. Why young companies from Europe are so successful.

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Quantum computers at the Jülich Research Center: The development of the technology is picking up speed. Photo: imago images/Rupert Oberhäuser

**Berlin.** Europe's quantum start-ups were able to outperform their global competitors last year. While investments collapsed worldwide, they soared in Europe despite the financing crisis and economic weakness. Backers invested a total of 363 million euros in European quantum start-ups in 2023, as the data service Pitchbook determined exclusively for Handelsblatt. That corresponded to an increase of 47 percent.

During the same period, global investments in young companies in the field of quantum technology fell by 27 percent to \$1.71 billion. The entire start-up sector even received 38 percent less. The "Quantum Technology Monitor" published on Thursday by the business consultancy McKinsey explains the upward trend on the one hand with the latest technological breakthroughs and on the other hand with higher government funding in Germany, for example, but also in Great Britain.

In contrast to conventional computers, quantum computers do not work with binary numbers, but with so-called qubits. These are able to assume an infinite number of states and not just two and can therefore solve a huge number of computing tasks in parallel.

## Quanten-Technologie-Start-ups

Top 10 der größten europäischen Start-ups  
nach Firmenbewertung in Mio Euro

		572 Mio. €
1.	Terra Quantum   Sankt Gallen	
2.	Pasqal   Massy	560
3.	IQM   Espoo	489
4.	Riverlane   Cambridge	156
5.	Multiverse Computing   San Sebastian	100
6.	Oxford Ionics   Kidlington	97
7.	Oxford Quantum Circuits   Reading	80
8.	Alice & Bob   Paris	73
9.	EbisBank   London	66
10.	Phasecraft   Bristol	60

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According to McKinsey, \$43 billion of government money has flowed into the sector worldwide to date - by far most of it in China.

“Many countries are aware that it is also about gaining a competitive advantage,” said Niko Mohr, partner in McKinsey’s Düsseldorf office and global head of quantum technologies. “We are experiencing extremely strong momentum.” In Germany alone, three billion euros are expected to flow into the promotion of quantum computers and their applications by 2026.



Daniel Volz co-founded Kipu Quantum in 2021. Photo: Kipu Quantum

The head of the Karlsruhe start-up Kipu Quantum, Daniel Volz, is of the opinion that young companies should benefit more from the state funding: "By far the largest part of the sum goes to non-industrial scientific organizations such as the Fraunhofer Society or Deutsche Center for Aerospace." This means that little is received by start-ups or large corporations that use quantum.

### **Will the quantum computer arrive at the end of the decade?**

Mohr is convinced that developments in the field of quantum technology are now gaining even greater momentum. "The timeline is moving forward. Maybe we will have a computer we can work with by the end of the 2020s," said the quantum expert. Because that is exactly what is still missing. According to the Federal Government's "Quantum Technology Action Plan", there should be a powerful and internationally competitive quantum computer in Germany by 2026 at the latest.



Niko Mohr heads the quantum technologies department at McKinsey. Photo: McKinsey

The CEO and founder of the currently most valuable European quantum start-up Terra Quantum, Markus Pflitsch, is just as confident as Mohr: "Quantum technologies are on the verge of fundamentally changing the world, and faster than expected."

According to Pitchbook, investors currently value the Swiss company, which is working on commercially usable quantum technology solutions, at around 570 million euros. Pflitsch sees the first commercial applications, for example, in financial service providers, who can carry out their calculations faster and more efficiently, as well as in drug research in the healthcare sector.

If everything comes together, the market could even grow to up to two trillion dollars by 2035, according to McKinsey. Previously, McKinsey had estimated the value creation potential at \$1.2 trillion.

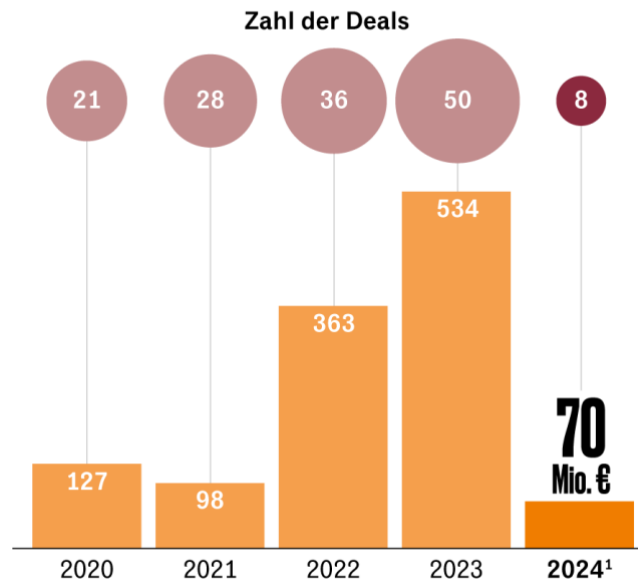
### **Boost from artificial intelligence**

In addition to Kipu Quantum from Karlsruhe, the European quantum start-ups that were able to raise capital from venture capitalists (VCs) last year included, among others, the quantum computer company Pasqal from Paris, Oxford Ionics and Riverlane from Cambridge, which has a specific quantum Develop chip. The Trumpf subsidiary Qant is also active in this sector.

The US start-up Sandbox AQ completed one of the world's largest financing rounds last year. The spin-off from the Google parent company Alphabet received \$500 million from investors.

## Hohe Investitionen

Investitionen in europäische Quanten-Start-ups  
in Mio Euro



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For McKinsey expert Mohr, the IT security provider Sandbox AQ is an example of how artificial intelligence and quantum technologies can be merged in a business model. He even goes one step further: "The two will grow together sooner or later," he believes. "If language models become even larger and more complex, we will eventually reach a point where the computing power is no longer sufficient." Ideally, quantum technology would then be available.

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