

TECH

Google quantum exec says tech is ‘5 years out from a real breakout’

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One of Google’s top executives working on quantum computers said he believe the tech is only five years away from running practical applications that can’t be calculated on modern computers.

“We think we’re about five years out from a real breakout, kind of practical application that you can only solve on a quantum computer,” said Julian Kelly, Google Quantum AI’s director of hardware.

Quantum tech has enjoyed increased attention after Google announced a breakthrough in error correction in December that the company said suggested a path to working quantum computers.

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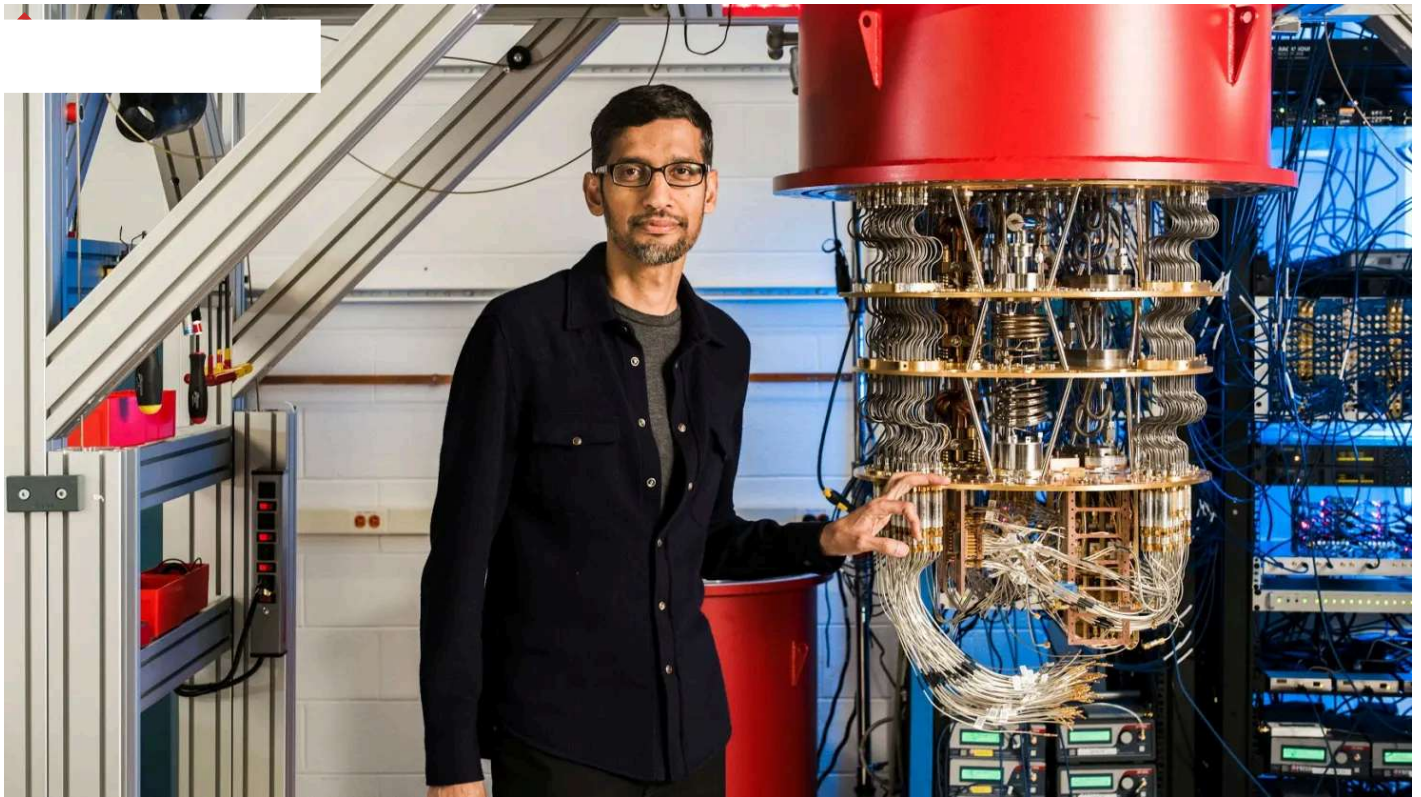
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Sundar Pichai with one of Google's Quantum Computers in the Santa Barbara lab, California, in October 2019.

Handout . / Reuters

One of [Google's](#) top executives working on quantum computers said he believe the technology is only five years away from running practical applications that can't be calculated on modern computers.

Julian Kelly, Google Quantum AI's director of hardware, told CNBC's Deirdre Bosa that a quantum computer may be able to do cutting-edge physics and potentially generate new kinds of data.

"We think we're about five years out from a real breakout, kind of practical application that you can only solve on a quantum computer," said Kelly in an interview aired Tuesday.

Quantum technology has enjoyed increased attention after Google announced a breakthrough in error correction [in December](#) that the company said suggested a path to working quantum computers.

[Microsoft](#) , meanwhile, revealed a new quantum computing chip called Majorana in February. The company had to create an "[entirely new state of matter](#)" to get the chip to work, CEO [Satya Nadella](#) said.

and [quantum computer has 105 qubits](#), or the basic building block of a quantum computer, while experts say 1 million or more qubits will be needed for useful applications.

Quantum computers have been a dream of physicists and scientists since the 1980s. While traditional computers are based around central processors or graphics processors with bits that are either 0 or 1, quantum qubits are on or off based on probability.

“Quantum computers speak quantum mechanics — they can access the way the universe works at the most fundamental level,” Kelly said.

The first applications for the technology will likely include using the system to simulate cutting-edge physics, Kelly said. That includes “areas where you’ve got some system that’s sort of just out of reach of what a classical computer to do,” he added.

Quantum computers may also be able to generate data used to train AI, although Kelly called this use “speculative.” He said that current artificial intelligence models fundamentally won’t be able to work on quantum computers.

“One of the potential applications that you can think of for a quantum computer is generating new and novel data,” Kelly said.

The quantum computing field has also benefited in recent months from attention on artificial intelligence chips made by [Nvidia](#) as investors search for another kind of next-generation processor that could spark a similar boom as [graphics processing units did during the recent wave of AI investment](#).

Nvidia doesn’t make quantum processors, but the company held a Quantum Day event last week where representatives from 12 leading quantum companies, [Amazon](#) and Microsoft talked about the potential of the technology.

The chipmaker’s summit came after Nvidia CEO Jensen Huang in January cast doubt on whether useful quantum computers would hit the market [in the next 15 years](#). Those comments caused the share prices of several public quantum companies to fall.

Huang last week walked back his January comments, [saying they were “wrong,”](#) but he still signaled that he thought technology had a long way to go.

“...computing has the potential and all of our hopes that it will deliver
...’, Huang said last week. “But the technology is insanely complicated.”

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The race to build a practical quantum computer

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