# First cat qubit quantum chip by Alice & Bob now available on Google Cloud Marketplace

Boson 4 quantum chip demonstrates unprecedented protection against one of two types of quantum errors, accelerating path to fault-tolerant quantum computers

PARIS, FRANCE, May 15, 2024 /EINPresswire.com/ -- Alice & Bob, a global leader in the race for fault-tolerant quantum computing, today announces the immediate availability on Google Cloud Marketplace of a new single cat-qubit chip in the "Boson" series. The company's signature technology, the cat qubit, is regarded as one of the most promising platforms for the realization of fault-tolerant quantum computers. The launch of Boson 4 marks the first time a cat qubit has become available to the public.
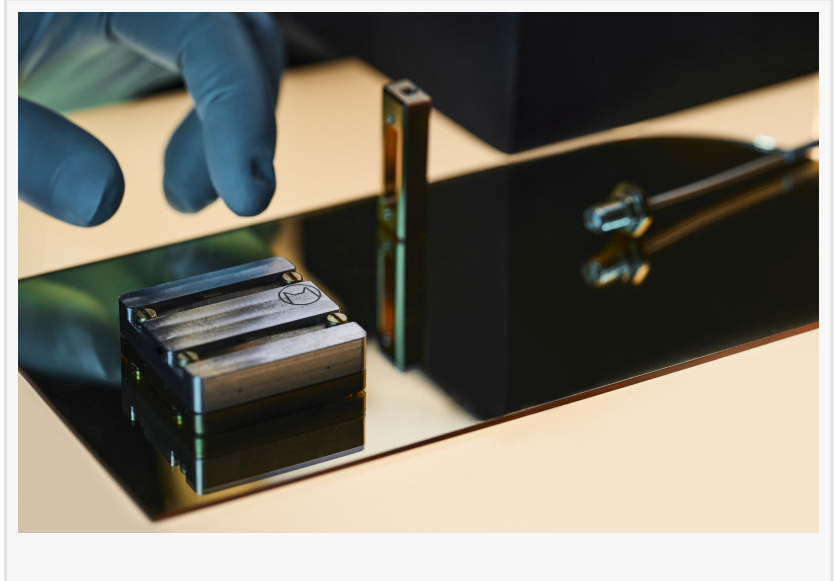
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"It's great to see continued advancement in the field. Protecting quantum information from one of the two errors that corrupt it is a promising path to making a robust quantum computer," said Hartmut Neven, VP of Engineering at Google. "The cat qubit is an interesting technology to have available for experimentation."

Quantum bits suffer from two types of errors, bit-flip and phase-flip. Each error occurs dozens of times per second in superconducting qubits in the best cases, usually far more often. The Boson 4 chip extends the bit-flip time to well over seven minutes - a four orders of magnitude improvement over the state-of-the-art and a world record for superconducting qubits. Next iterations will focus on improving the phase-flip performance and enabling multi-qubit operation.

Fault tolerance is now seen as a mandatory achievement to unlock the full value of quantum computing. If proven and scaled, it would enable industry-changing applications in chemistry, biotechnology, cryptography, and other fields. This chip demonstrates a cornerstone of Alice & Bob's approach to fault-tolerant quantum computing: embedding bit-flip correction in each qubit. Cat qubits are protected from bit-flips by design, up to the point where additional error-correcting qubits are only needed to tackle the remaining phase-flips. This makes it possible to create fault-tolerant computers using far fewer qubits (up to 200 times fewer, [according to the latest paper by Alice & Bob and Inria).](#)
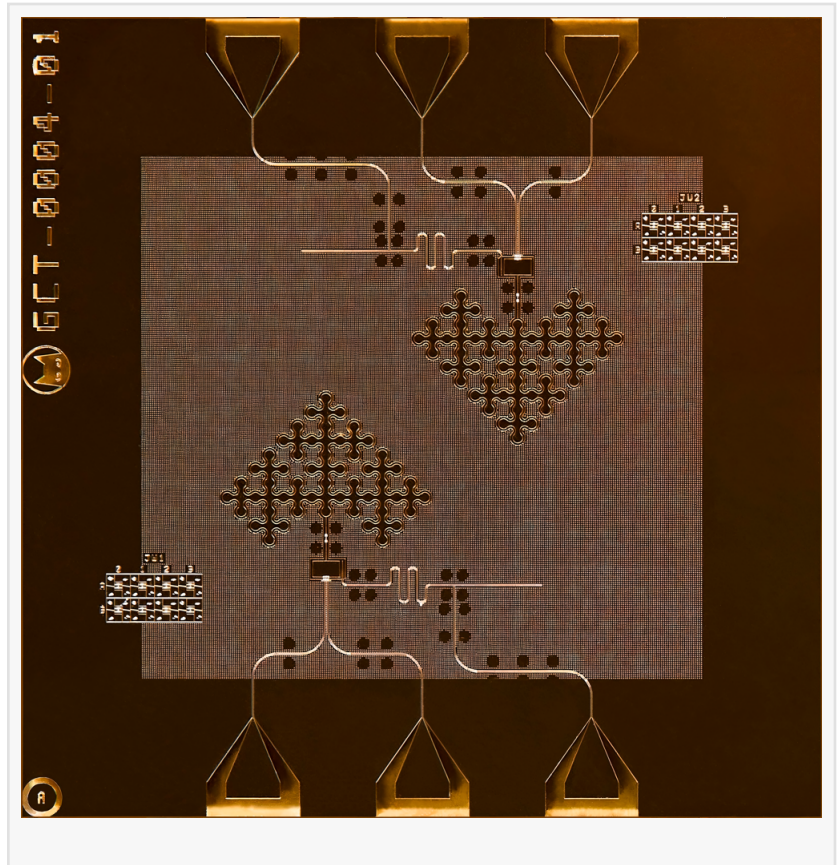
With the [Boson 4 chip now available](#) to the public on Google Cloud Marketplace, the scientific community can verify the benefits and potential of cat qubits by performing its own experiments.

"When my co-founder and I started Alice & Bob, many thought cat qubits would never be more than a lab concept. We are now the first company to make a cat qubit chip available for everyone to use," said Théau Peronnin, CEO and co-founder of Alice & Bob. "We are convinced Boson 4 will spark interest among researchers and we are committed to continuously extending the range of experiments which can be performed with it."

About Alice & Bob
Alice & Bob is a quantum computing company based in Paris and Boston whose goal is to create the first universal, fault-tolerant quantum computer. Founded in 2020, Alice & Bob has already raised €30 million in funding, hired over 95 employees, and demonstrated experimental results surpassing those of technology giants with far greater resources. Alice & Bob specializes in cat qubits, a pioneering technology developed by the company's founders and later adopted by Amazon. Demonstrating the power of its cat architecture, Alice & Bob recently showed that it could reduce the hardware requirements for building a useful large-scale quantum computer by up to 200 times compared with competing approaches. Follow Alice & Bob on LinkedIn, X or YouTube, visit their website www.alice-bob.com, or join The Cat Tree on Slack to learn more.

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