

Alice & Bob shares first results from France's PROQCIMA quantum programme

Three operational cat qubit demonstrators built and tested

PARIS, FRANCE, October 20, 2026 /EINPresswire.com/ -- [Alice & Bob](#), a leader in fault-tolerant quantum computing, today shares a summary of results from Phase 1 of PROQCIMA, the French government's quantum computing programme.



Led by the French Defense Innovation Agency (AID) and the Direction générale de l'Armement, PROQCIMA aims to develop two prototypes of universal quantum computers, each capable of supporting 1,000 logical qubits, ready for industrialisation by 2032. The programme is structured as a 10-year competition: three candidates will continue after the first four years, with two ultimately selected to continue beyond year eight.

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Théau Peronnin, CEO, Alice & Bob

Five companies were selected to participate: Alice & Bob, Pasqal, Quandela, Quobly and C12.

The first phase of the programme was designed to assess the technical and industrial feasibility of each company's

approach. Each candidate was required to demonstrate the expected level of technological maturity, including through the development and testing of its technology on real hardware. Alice & Bob began work on Phase 1 of PROQCIMA in 2024, committing to build an integrated multi-block demonstrator with partial functional validation to demonstrate the core operations of its error-correction architecture on real hardware.

Alice & Bob has delivered on that commitment. The company assembled and operated three independent demonstrators, two on 6-qubit chips and one on a 12-qubit chip. The team demonstrated each building block of a cat qubit logical qubit with further optimisation on-going, with measured, documented performance, including:

-Noise-biased CNOT gates between cat qubits, preserving their built-in protection against bit flips, both key characteristics for the error correction approach followed by Alice & Bob

-A measure-and-reset sequence for the auxiliary qubits, which reads out the qubit state carrying the error syndrome and re-prepares each qubit for the next quantum error correction cycle, with performance broadly in line with programme targets

-Multiple cycles of a three data qubit (distance-3) repetition code, the smallest code able to correct a quantum error

-Measurement of the logical error rate across the full register, a key capability for tracking progress toward fault tolerance, achieving a logical error rate not yet below threshold

-A non-Clifford gate on a cat qubit, an essential ingredient for universal fault-tolerant quantum computing and a first step toward producing the "magic states" it requires.

Alongside the hardware results, Alice & Bob built a digital twin of the processor from its measured performance data. Simulations run on it show the improvements needed to operate below the error-correction threshold, starting with extending qubit coherence consistently across the chip.

The demonstrators were supervised by Alice & Bob's MnR (monitoring and recalibration) proprietary software. Running around the clock and operating when the QPU was idle, the software measured performance across more than 50 indicators per qubit, detecting when a qubit drifted and required recalibration. Previously, detecting and correcting drifts could cost up to a day of operating time. The software keeps the processor at a consistent performance level.

"The race for fault-tolerant quantum computing is a question of who will master one of the defining technologies of this century, and France starts from a position of real strength. Our PROQCIMA Phase 1 results show that the cat qubit approach, combined with Alice & Bob's expertise, can lead that race and push the frontiers of science," says Théau Peronnin, CEO, Alice & Bob.

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 raised €180 million in funding and employs more than 250 people.

Advised by Nobel Prize winning researchers, Alice & Bob specializes in cat-qubits, a technology developed by the company's founders. 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 up to 200 times compared with competing approaches.

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