



ALICE & BOB



ENS  
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PSL



## Alice & Bob and research partners granted €16.5 million in public funding to make quantum computing 10 times cheaper

*Alice & Bob is the first company ever to receive all four innovation grants from the French State*

PARIS, France -- March 27, 2024 -- Alice & Bob, a leading hardware developer in the race to fault tolerant quantum computers, and academic partners ENS de Lyon and Mines Paris - PSL, proudly announced the receipt of a €16.5 million (\$17.8 million USD) innovation grant, a France 2030 initiative operated on behalf of the French state by Bpifrance, France's public investment bank. The deal, endorsed by the Prime Minister Gabriel Attal, positions Alice & Bob at the forefront of a pivotal 36-month project. This endeavor aims to fast-track quantum computing by enhancing the entire stack's efficiency, reducing costs and accelerating market readiness.

"We are honored to be entrusted with the task of making quantum computing useful earlier," said Theau Peronnin, CEO of Alice & Bob. "Our plan, centered around cat qubits, addresses the real challenges of quantum computing headfirst, enabling massive savings in energy and end-user costs."

The projected cost of quantum computation due to cryogenics and control of large sets of qubits presents a barrier to widespread adoption. Alice & Bob will use the funding to optimize quantum computation, from design to manufacturing and infrastructure to make quantum computers 10 times cheaper to build and ready for market 3 years earlier.

The funded project, called "Cat Factory," brings industry and government partners to tackle quantum computing's critical issues across various enabling technologies, including nanofabrication, chip design and validation, digital tools and electronic control.

"Quantum computing algorithms require hundreds of logical qubits, which translates to thousands to millions of physical qubits," said Florent Di Meglio lead on the project at Mines Paris - PSL. "Cat Factory will develop the technology required to fit 100 logical qubits with only one large cryostat, a dramatic reduction in the hardware needs for running a useful quantum computer."

To achieve this goal the partners will work on the whole quantum computer architecture and the infrastructure of enabling technologies surrounding it. The project's cornerstone, the cat qubit, already reduces the number of physical qubits required to build a logical one by a factor of 60. Alongside this key innovation, the "Cat Factory" addresses a wide range of other quantum hardware challenges, described in the focus section at the bottom.

Bruno Bonnell, secretary general for investments, in charge of France 2030, at prime minister's office, declares: "France's commitment to creating the first fault tolerant quantum computer is a tangible one, and we are proud, with France 2030, to advance innovation in this direction to set the stage for the next decade."

“We are delighted to support Alice & Bob in its development, which aims to accelerate the progress of quantum computing. This support reflects Bpifrance’s strong ambitions in terms of disruptive innovation”, says Paul-François Fournier, Executive Director, Innovation at Bpifrance.

“To build a fault tolerant quantum computer we must solve hard engineering challenges that no player alone could. This is why we are thrilled to collaborate with Alice & Bob and Mines Paris – PSL,” said Audrey Bienfait, Research Lead on the project for ENS de Lyon.

## **FOCUS**

The research goal from the three partners is to reach a new optimized architecture for fault tolerant quantum computing by 2027 that will allow:

- Reduction of the number of control lines per cat qubit.
- Reduction of the readout lines per cat qubit.

To achieve this degree of optimization, the infrastructure of enabling technologies surrounding the Quantum Processing Unit (QPU) will be updated to:

- Increase the number of analog ports per rack, dividing by 3 the footprint of control electronics.
- Increase control lines per cryostat using next generation cabling technology.

## **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 such as Google or IBM. 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](http://www.alice-bob.com), or join [The Cat Tree](#) on Slack to learn more.

## **About ENS de Lyon.**

The École Normale Supérieure de Lyon conducts high-level research in its 25 laboratories and trains around 2,500 students through research, including 500 doctoral students. In the Shanghai and QS rankings, it ranks first among French institutions in terms of performance per capita. Its objective is to have a significant impact in research, innovation, and technology transfer while influencing the public sector and the socio-economic world with graduates skilled in complexity, capable of producing and transmitting knowledge. ENS de Lyon puts its resources at the service of an open vision of society and

contemporary issues that it aims to illuminate. Alice and Bob, led by a former student, are among the thirty startups that have been incubated by ENS de Lyon.

### **About Mines Paris - PSL**

Mines Paris – PSL, part of the PSL University, educates engineers capable of tackling tomorrow's challenges, outstanding scientific leaders, and international talents. Aligned with its strategic plan, the school aspires to be a key player in innovation and entrepreneurship, energy transition, materials for more efficient technologies, mathematics, and digital engineering for industrial transformation, including healthcare. Since its establishment in 1783, Mines Paris - PSL remains committed to its values of solidarity and openness to society.