Press release

France is moving forward with an unprecedented national and European hybrid HPC–QC platform

Chicago and Paris, November 18, 2026

It's a major milestone for the France Hybrid HPC-Quantum Initiative (HQI): with two more quantum systems on the way, and the arrival of the Alice Recoque exascale system in 2027, the HQI platform is set to offer unrivaled post-exascale hybrid quantum computing services to French and European open research communities. Two quantum systems already in production at CEA's TGCC computing center near Paris, coupled to GENCI's Joliot Curie supercomputer, have already enabled research communities to explore numerous use cases around material science, QML and optimization.

HQI platform currently features **Ruby**, a 100+-qubit neutral atom quantum computer from Pasqal, operational since November 2025, and **Lucy**, a 24-mode photonic quantum computer from Quandela, in production since May 2026. Both are installed at TGCC and coupled to GENCI's Joliot-Curie supercomputer, and have already enabled research communities to explore numerous use cases in materials science, quantum machine learning (QML) and optimization.

They will be joined in 2027 by Kity, an 18-cat-qubit system from Alice & Bob.

A decade of building a quantum ecosystem

The story began in **2020** with the Paris Region Quantum Pack, a co-funding scheme to support the adoption of quantum computing by industrial end-users. Facilitated by GENCI alongside ecosystem organizations such as Teratec, Le Lab Quantique and Pôle Systematic, it launched some 20 successful projects across energy, pharma, industrial process optimization, defense and space, aeronautics, banking and insurance.

In **2022**, GENCI, CEA and Inria were mandated by the French government to launch the **France Hybrid HPC-Quantum Initiative (HQI)** as part of the national Quantum Strategy (France 2030). The platform is dedicated to open science and accessible free of charge to French academic and industrial research communities. Programming and emulation environments — Qaptiva (Bull), Pulser (Pasqal), Perceval and MerLin (Quandela), Qiskit (IBM) — were deployed to help users prepare their codes for the arrival of actual quantum devices. The program also includes training sessions led by CEA and the technology providers, and a dedicated High-Level Support Team (HLST) assisting users in porting their applications. In 2025, GENCI and CEA launched the **"Maisons du Quantique"** label, federating five regional initiatives — from the Alps, the Paris Region, Occitanie, Nouvelle Aquitaine and Grand Est — to promote hybrid quantum computing among local communities. In February 2026, the Quantum Center of Excellence for Quantum-

Enhanced Applications (QEC4QEA) was launched, bringing together 19 industrial and academic partners including CEA to create a one-stop shop for quantum solutions, support services and educational programmes. This initiative articulates with the HQI-related support to end-user communities.

Two European quantum systems in production, with flagship use cases

From the outset, France chose to align its national quantum strategy with its European counterpart: both first QPUs of the HQI platform are EuroHPC systems.



Ruby quantum computer, at the CEA TGCC ©Pasqal

Ruby* (neutral atoms, Pasqal) was co-funded by the EuroHPC JU through the HPCQS project, acquired by GENCI in 2022 and inaugurated at TGCC in November 2025. Available to French communities since then, and to EuroHPC users since June 2026, Ruby has been used by a wide range of communities solving MIS (Maximum Independent Set) problems across different use cases. Notable projects include the **generation of physically grounded sound** — turning the system's specific behavior into an aesthetic experience — , a hybrid quantum-classical pipeline to analyze a visual iconographic corpus, and numerous benchmark initiatives in France and across Europe.



Lucy quantum computer, at the CEA TGCC ©Quandela

Lucy** (photons, Quandela) was acquired by the EuroHPC JU in 2024 for the EuroQCS-France consortium and inaugurated at TGCC in April 2026. Available to French communities since May 2026 and to EuroHPC users since August 2026, it has been one of the most requested systems so far. As part of EuroQCS-France, Lucy was used by ICHEC to study specific dual-rail encodings to **analyze the properties of molecules**, including alcohols, simple amino acids and PFAS components. Building on Quandela's prior research with end-users, Lucy also serves as a tool to experiment with **QML workflows** — generative QML, quantum convolutional neural networks (QCNN) and quantum reservoir computing — supported by the MerLin framework. Many more use cases are expected as new end-users apply through the EuroHPC peer-review portal.

Ruby and Lucy are part of a **European-wide network of 10 HPC-QC infrastructures** that expose an **unprecedented diversity of quantum technologies** for open research in Europe. All of these quantum systems acquired or co-funded by EuroHPC JU were **designed and produced in Europe**.

2027: two additional technologies and new opportunities with Alice Recoque

GENCI and CEA joined **EuroSSQ-HPC**, the consortium led by SURF (Netherlands) selected by the EuroHPC JU in 2024 to host and operate a 16+-spin-qubit quantum computer. French open research communities will enjoy privileged access to about 20% of the system's workload, while CEA contributes to the HPC-quantum integration work as part of the EuroQHPC-S project. This remote access will allow end-users to get acquainted with the **specifics of spin-qubit technologies** and adapt their work to the system's topology constraints and "universal" gate set.

GENCI also acquired an 18-cat-qubit **Alice & Bob** system in June 2026. Called **Kity**, it will be installed at TGCC in 2027 and coupled with the upcoming **Alice Recoque exascale supercomputer**, alongside Ruby and Lucy. Fully funded through the HQI national program, Kity

is primarily seen as an **experimental environment for error correction** — both from an end-user standpoint and to study the impact of HPC-quantum integration on error correction. Its native imbalance between phase-flip and bit-flip errors could be leveraged to **find new algorithms that benefit from it**, and it will also serve as an **exploration tool for continuous variables**, with potential applications in cryptography.



Kity Quantum computer ©Alice & Bob

On the road to fault-tolerant quantum computing (FTQC)

The HQI platform was initially designed to host and integrate NISQ devices and support open research communities in that technological era. With the launch of the **PROQCIMA** innovation challenge in France in 2024 and the European strategy to address FTQC, hybrid platforms such as HQI have become critical tools: they help open research communities catch up with these new technologies, provide answers on how to best host and integrate future devices in HPC centers, and support the development of robust quantum algorithms that will benefit from FTQC systems.

With the arrival of the Alice Recoque exascale system at TGCC in 2027, the HQI platform will feature **unrivaled post-exascale hybrid quantum computing services** for the benefit of both French and European open research communities.

**Ruby was acquired through the HPCQS project, co-funded by EuroHPC Joint Undertaking and member states Germany, France, Italy, Ireland, Austria and Spain in equal parts under the Grant Agreement no. 101018180.*

***Lucy was acquired throught the EuroQCS-France project, co-funded by EuroHPC Joint Undertaking and France in equal parts under the Hosting Agreement no. 06/2023.*

****Ruby and Lucy were co-funded by France through the national HQI program (ANR-22-PNCQ-0001, part of France2030). Kity was entirely funded by the national HQI program.*

Quotes

- Loïc Le Loarer, Head of the National Quantum Strategy declared:

"With the HQI platform, France is not only deploying cutting-edge quantum systems like Ruby, Lucy, and the upcoming Kity, but also ensuring that researchers and industries have immediate access to these machines to experiment with real-world use cases. The integration of these quantum computers with the future exascale system Alice Recoque will create a unique environment to explore hybrid HPC-quantum workflows, accelerating the discovery of practical applications and paving the way toward Fault-Tolerant Quantum Computing (FTQC)."

- Jacques-Charles Lafoucriere, programme director and Senior Fellow at CEA said:

"France's national strategy for quantum technologies has enabled the establishment of a unique hybrid HPC/quantum computing platform at the CEA/TGCC. The addition of an exascale supercomputer in 2027 will make it an exceptional environment open to all European research, driving numerous scientific breakthroughs."

- Michaël Krajecki, CEO of GENCI declared:

“The close collaboration between EuroHPC at the European level and the French Hybrid HPC-Quantum Initiative (HQI) has enabled us to build a unique platform for French and European research communities, bringing together European quantum technologies and an unprecedented diversity of computing approaches. Beyond providing researchers with access to these technologies and the opportunity to explore their potential through real-world applications, our ambition is to help scientific communities develop the skills, methods and expertise needed to prepare for the next major breakthrough in quantum computing: the advent of fault-tolerant quantum computing (FTQC).”

About HQI

HQI (France Hybrid HPC Quantum Initiative) is a national initiative. It aims to combine a hybrid computing platform, a research program—involving both academia and industry—and efforts o promote its applications.

Launched by the General Secretariat for Investment (SGPI) as part of France 2030, HQI receives support from the National Research Agency (ANR) on behalf of the French government under the France 2030 program, along with a total budget of €72.3 million from France 2030.

About France 2030

The France 2030 investment plan

France 2030 is unprecedented in its scale: €54 billion is being invested so that our businesses, our schools, our universities and our research organizations fully succeed with their transitions in these strategic sectors. The challenge is to enable them to respond in a competitive way to the world's future ecological and attractiveness challenges, and to showcase the future champions of our sectors of excellence. France 2030 is defined by two overarching objectives, which will see 50% of expenses given over to the decarbonization of the economy, and 50% to emerging key players, those at the forefront of innovation, without neglecting the environment (in the sense of the "Do No Significant Harm" principle).

France 2030 is being implemented collectively: designed and deployed in consultation with economic, academic, local and European key players to establish strategic guidelines and decisive action. Project holders are invited to submit their entries via the current application process, which is a demanding and selective one, to benefit from state support.

France 2030 is being led by the French General Secretariat for Investment, in charge of France 2030, on behalf of the Prime Minister, and in partnership with the relevant government ministries.

France 2030 is being implemented by the French National Research Agency (ANR), the French Agency for Ecological Transition (ADEME), Bpifrance and the Caisse des Dépôts et consignation (CDC).

More information : france2030.gouv.fr

Press contacts

GENCI I Nicolas Belot I + 33 7 60 99 95 10 **I** nicolas.belot@genci.fr

French General Secretariat for Investment **I** + 33 1 42 75 64 58 **I** presse.sgpi@pm.gouv.fr