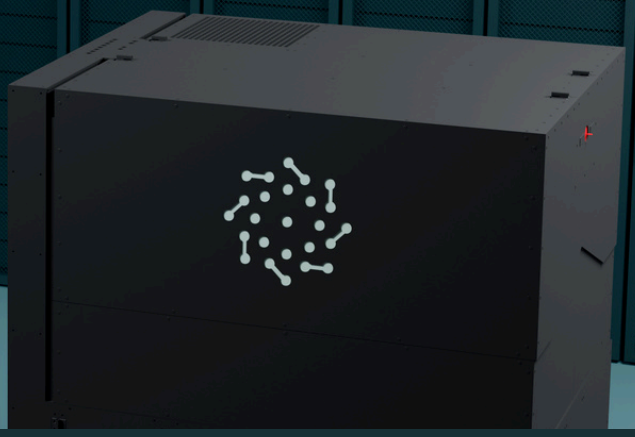
Pasqal

Quantum enhances the HPC stack

Pasqal brings quantum computing into world-leading HPC centers

Pasqal helps HPC centers turn quantum computing into a service for their users. Our room-temperature neutral-atom QPUs fit into your existing operations, and our experts guide you from first use case to measurable impact in simulation, optimization and machine learning.



140+
Reconfigurable qubits

20-21°C
No cryogenics required

3
QPUs already deployed in HPC centers

Why a neutral-atom QPU for HPC centers

ROOM-TEMPERATURE OPERATION
No dilution refrigerators. Data-center-compatible power and cooling.

UNIFORM QUBIT QUALITY
Natively identical qubits across the register.

PROGRAMMABLE QUBIT GEOMETRY
Problem-adapted reconfigurable qubit arrays on demand.

SCALABLE ARCHITECTURE
Arrays expandable to 1,000s of qubits without core hardware changes.

Fits the way you run HPC

Pasqal QPUs run on-premises, in your data center and under your security policies, with an operational model that mirrors how your teams already run classical resources.

- Native integration with Slurm, PBS, Flux and Gridware/Open Cluster Scheduler through QRMI and Bull's Qaptiva.
- QPU co-scheduling alongside CPUs and GPUs for hybrid workflows.
- Integration with standard monitoring and operations tooling.
- Open ecosystem support: CUDA-Q, Qiskit, Pulser, Pulser Studio, and QoolQit.

Full-stack approach

HARDWARE
Neutral-atom QPUs designed for integration and already deployed in HPC environments.

SOFTWARE & EMULATION
Open-source Python tools: QoolQit for hardware-agnostic workflow development and Pulser for pulse-level programming. QPU emulation, locally or via Pasqal Cloud, lets you develop, validate and benchmark before hardware runs.

QUANTUM APPLICATIONS
Open-source libraries for combinatorial optimization (MIS, QUBO) and graph machine learning via Quantum Evolution Kernel.

QUANTUM EXPERTISE
Our experts help you and your users identify and scope use cases feasible on Pasqal Orion, run a hands-on feasibility analysis, and define KPIs to measure impact.

Proven on real-world problems

MATERIALS SCIENCE
Simulated the real magnetic material $TmMgGaO_4$ on a 256-qubit system, quantitatively matching laboratory measurements, then explored its out-of-equilibrium dynamics, a regime beyond classical reach.

arXiv: https://arxiv.org/abs/2603.20372

ENERGY
A method that reuses optimization settings across similar problems, cutting costly fine-tuning. Validated on Pasqal hardware up to 100 qubits and applied to EV smart-charging on a real dataset.

arXiv: https://arxiv.org/abs/2411.16656

TELECOMMUNICATIONS
A hybrid quantum-classical method for graph coloring, key to frequency assignment, reached optimal solutions on ~98% of benchmark instances, with early validation on real hardware.

arXiv: https://arxiv.org/abs/2508.18887

Pasqal

Live deployments in HPC centers

CEA/TGCC
September 2025 — France

Pasqal Orion Beta — 100+ qubits

Jülich Supercomputing Center
November 2025 — Germany

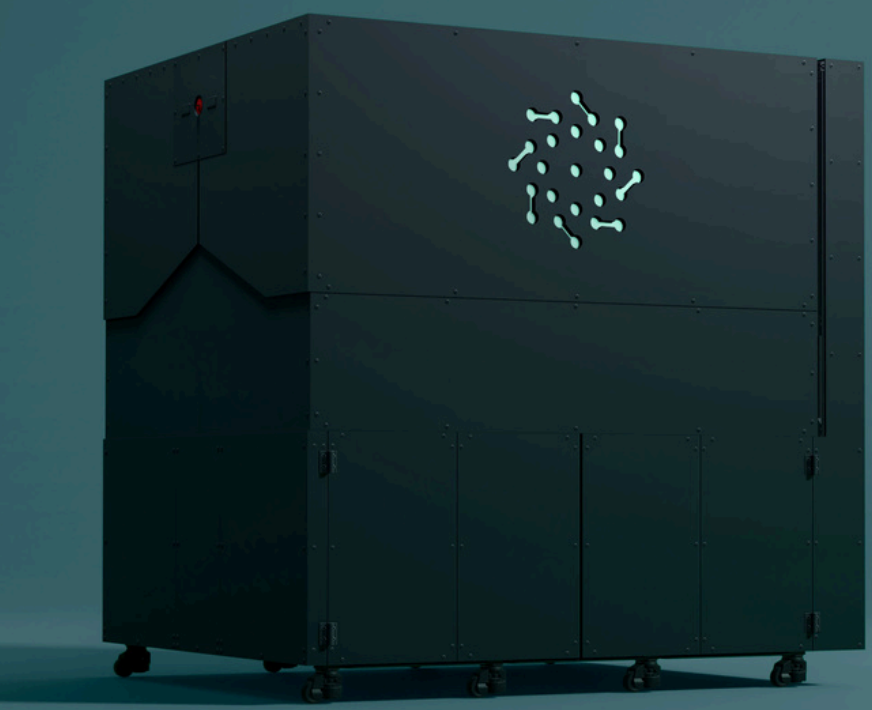
Pasqal Orion Beta — 100+ qubits

Cineca - Leonardo
February 2026 — Italy

Pasqal Orion Gamma — 140+ qubits

Start today on Pasqal Orion, already running in three HPC centers, and grow with us toward quantum advantage. Every use case you develop now carries forward to our next-generation systems.

Pasqal Orion



QPU SPECS

Reconfigurable qubits	Nominal number: 140 Max number: 200
Max Rabi frequency	2 MHz
Max detuning	7.75 MHz
Effective Computation Repetition Rate	0.25 Hz (for defect-free registers)
Peak power	~10 kW (avg ~4 kW)
Power supply	1×380V 3P+N+E 32A
Networking	2× Ethernet RJ45
Operating temperature	20-21°C
Footprint and weight	~200 × 590 × 390 cm; ~4,000 kg

Start your quantum journey

Book a feasibility workshop with our experts to identify your first high-impact use cases.

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