



Finalising a Pan-European Hybrid HPC/Quantum Infrastructure

OBJECTIVE

Develop, deploy and coordinate a non-commercial cloud-based European federated infrastructure, tightly integrating two quantum simulators (Qs), each controlling more than 100 qubits.



100+ qubit Pasqal quantum simulators



PROJECT

- Duration: 2021–2025
- Coordinator: Forschungszentrum Jülich GmbH
- 15 partners + 3 linked 3rd parties from 6 countries

OUTCOME

Creation of a quantum-HPC hybrid system as an essential step forward to utilise the power of Qs for handling first practical applications related to complex simulations and optimisation problems, such as materials and drug design, logistics and transportation.

ACHIEVEMENTS

- Installation and commissioning of two Pasqal Qs
- Co-design of pilot HPC-QS use-case applications with hybrid system software and programming framework
- Design of a resource management that covers hybrid use cases from interactive cloud usage to quantum-offloading by parallel HPC jobs
- Development of a generic programming language for the input to the QS

MILESTONES

- Procurement of two quantum simulators (Qs)
- Installation of the QS at CEA/TGCC and FZJ/JSC
- Development and deployment of a full hybrid software stack
- Training and user engagement with use case demonstrators

Pasqal QS in France:



Pasqal QS in Germany:

