⟨HPC|QS⟩

High Performance Computer – Quantum Simulator hybrid

www.hpcqs.eu

Towards a Pan-European Hybrid HPC/Quantum Infrastructure

PROJECT

Duration: 2021–2025

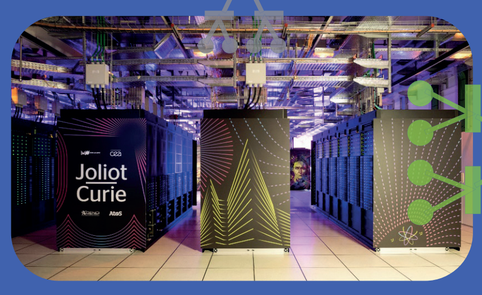
Coordinator: Forschungszentrum Jülich GmbH

15 partners + 3 linked 3rd parties from 6 countries

OBJECTIVE

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

100+ qubit
Pasqal quantum simulators



OUTCOME

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

ACHIEVEMENTS

- Selection of Pasqal as supplier for two neutral atom QSs
- Technical requirements assessment for use case development
- Design of resource management interface between HPC system and QS and of JupyterHub-based portal
- Development of a generic programming language for the input to the QS

MILESTONES

- Procurement of two quantum simulators (QSs)
- 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

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