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Factsheet

ACRONYM PASQuanS2.1

FULL TITLE Programmable Atomic Large-scale Quantum Simulation 2 – SGA1

PROGRAMME HORIZON-CL4-2021-DIGITAL-EMERGING-02

CONTRACT NUMBER 101113690

ABSTRACT The project Programmable Atomic Large-scale Quantum Simulation (PASQuanS2.1) is the first decisive step toward the transformation of the European landscape for programmable quantum simulators, finally delivering internationally leading platforms involving over 1,000 neutral atoms in optical tweezer arrays and also in optical lattices. In the context of this project, we will bring together partners from academia and industry (including technology enablers, platform developers, and end-users) to address central technological challenges. We will connect technologies across national borders and use our combined expertise and technologies to scale up the system size, reduce noise and temperature, and improve stability. We will test and transfer know-how between trapped ion and neutral atom platforms and integrate the hardware with application-specific software stacks for analogue solutions to relevant real-world problems, including verification and optimal control techniques. We will facilitate the expansion and networking of the supply chain and startup companies delivering platforms, *en route* to the delivery of technology readiness level (TRL) 6-7 quantum simulators, including both cloud-based platforms, and quantum simulators linked with existing high-performance computing infrastructure. We will work with the end-user community across academia and industry to identify new specific applications where quantum simulators provide a practical quantum advantage over traditional high-performance computing. In particular, we will address potential applications in materials science, quantum chemistry and optimisation.

DURATION 42 months (01/04/2023 – 30/09/2026)

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