

Meetings of the Belgian Quantum Physics Initiative

Colloquium



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Scalable quantum computing with neutral atoms

Quantum processors are the base of the quantum stack. Neutral atom arrays have recently emerged as a highly promising quantum computing platform. These atoms can be well isolated from the environment and prepared in large systems of hundreds or thousands of particles with different geometries using laser cooling and trapping techniques. The most well-established approach is atom-by-atom assembly where single atoms are trapped and individually positioned in desired geometries using optical tweezers. Quantum information is encoded in the internal states of atoms with interactions mediated via their highly electronically excited Rydberg states.

The colloquium will attribute different aspects of the stack, where we start from the bottom from the ultracold atoms, and via optimal control and hybrid quantum-classical algorithms, quantum error correction, we end with the integration in a high-performance computing cluster.

Thursday 14th DECEMBER 2023 AT 2 P.M.

COFFEE AND TEA WILL BE SERVED AT 3 P.M.

Two short talks will follow:

4:00pm: David Gaspard (Institut Langevin, Paris)

« Quantum Scattering, Transport, and Decoherence in Disordered Media »

4:30pm: Tobias Haas (ULB)

« General class of continuous variable entanglement criteria »