

# A Neutral Atom Quantum Processor Supporting Long Coherence Times

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Atom Computing is creating a quantum processing platform based on nuclear spin qubits. The system makes use of optical tweezers to assemble and individually manipulate a two-dimensional register of neutral strontium atoms. We demonstrate the robustness of these systems by characterizing their coherence times, showing a  $T_1 \gg 10\text{s}$  and  $T_2^{echo} = 40 \pm 7\text{s}$ . While other systems have shown impressive coherence times through some combination of shielding, careful trapping, global operations, and dynamical decoupling, we achieve comparable coherence times while individually driving multiple qubits in parallel. The talk will also explore progress on a 100 qubit hardware platform and the potential of the technology to create scalable quantum computing solutions.

[1] K. Barnes et al, *Nature Communications* **13**, 2779 (2022).