

A next-generation trapped ion quantum computing system

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The first generation of a universal trapped ion integrated quantum processor, constructed in a collaboration between universities and industrial partners, was used to perform quantum algorithms with high-fidelity on 12 qubits, and high-fidelity quantum gates with up to 23 qubits. We present progress on the second-generation system, which has several design improvements, such as a capacity of 32 qubits, parallel addressing capability using an RF-System-On-Chip, a next-generation micro-fabricated surface ion trap from Sandia National Laboratories, and the integration with the upgraded Raman and CW laser systems built by L3Harris.