Quantum Computing with Trapped Atomic Ions

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Trapped atomic ions are a leading physical platform for networked quantum computers, featuring qubits with essentially infinite idle coherence times and the highest purity quantum gate operations. Such atomic clock qubits are controlled with laser beams, allowing densely-connected and reconfigurable universal gate sets. The path to scale involves concrete architectural paths based on well-established protocols, from shuttling ions between QPU cores to modular photonic interconnects between multiple QPUs. I will summarize the state-of-the-art in these quantum computers in both academic and industrial settings, for both scientific and commercial applications.