Quantum physics with trapped ions

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Trapped-ion systems provide a well-isolated environment for developing high-fidelity quantum technologies. Their individual qubit control, long coherence times, and ability to engineer long-range interactions mediated by light and phonons make them a powerful platform for next-generation quantum technologies. In this workshop, I will present recent results in quantum simulation on a trapped-ion quantum simulator. In particular, I will demonstrate how spin relaxation can be investigated in individually controlled, interacting ion chains. I will also discuss the technical challenges associated with scaling up such platforms and provide an outlook on future research directions with large-scale trapped-ion systems.

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