

Physikalisches Kolloquium



Thursday, 12.11.2020, 16:15
Online via Zoom

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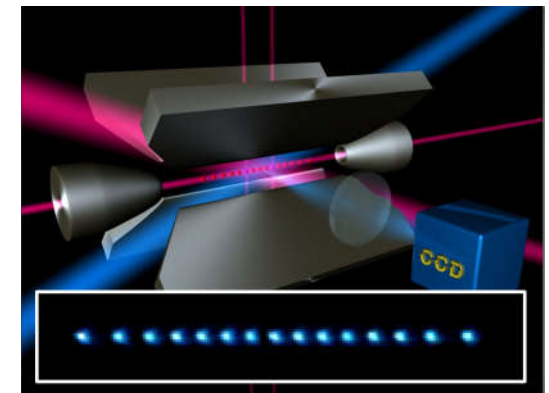
SMolBits Colloquium: The Quantum Way of Doing Computations

Abstract

In this talk, the basic functional principles of quantum information processing are reviewed and the state-of-the-art of the Innsbruck trapped-ion quantum computer is reported. With strings of trapped ions, we implement a quantum information processor and perform quantum operations. We present an overview on the available quantum toolbox and discuss the scalability of the approach. The quantum way of doing computations is illustrated with analog and digital quantum simulations. Employing universal quantum computations, we investigate the dynamics of the Lattice Schwinger model [1], a gauge theory of 1D quantum electrodynamics and using a hybrid-classical ansatz, we determine steady-state properties of the Hamiltonian [2].

[1] E. A. Martinez et al., Nature 534, 516 (2016).

[2] C. Kokail et al., Nature 569, 355–360 (2019).



All of you interested in physics are cordially invited!