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Seminar über Quanten-, Atom- und Neutronenphysik (QUANTUM)

April 18, 2024 at 2 p.m. c.t.
IPH Lorentzraum 05-127

Dr. Felix Tennie
Imperial College, London, UK

Quantum Algorithms for integrating nonlinear Differential Equations

Nonlinear differential equations are ubiquitous in Physics, Engineering, Chemistry, Materials Science, and various other subjects. Numerical integration often requires resources exceeding current classical supercomputers. Quantum computing presents a fundamentally different computing paradigm. Quantum algorithms have a proven scaling advantage in many linear tasks such as Fourier transformation, matrix inversion, SVD, to name but a few. Yet, due to the linear evolution of quantum systems, integrating nonlinear dynamics on quantum computers is hard. In this talk I will present different approaches for integrating nonlinear differential equations on quantum computers, and will discuss their suitability for different types of quantum hardware.

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