

SEMINARI

principi natura modello
metodo matematica

andezze valore **fisica** generale spazio classica sistemi
teorie studio
antistica materia **dati** fenomeni grandezza
sperimentale esempio misura
fondamentali incertezze
riferimento **teoria**
nucleare relativa **FILOSOFIA**



UNIVERSITÀ
DI TRENTO
Dipartimento di
Fisica

Dr. Giuseppe Clemente - Deutsches Elektronen-Synchrotron - DESY, Berlin

20 June 2023, 2 pm

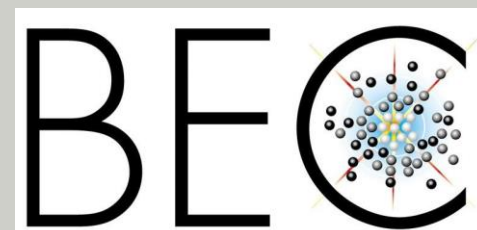
Room A107, Povo1

BEC Seminar: Quantum Algorithms for Lattice QFTs at Finite Temperature and Non-Abelian Gauge Theories

Abstract

In the last few decades, standard Markov Chain Monte Carlo techniques proved successful in the investigation of non-perturbative features of lattice quantum field theories and non-abelian gauge theories such as QCD. However, simulating real-time dynamical processes, phase diagram at non-zero baryonic chemical potential, non-zero topological theta term, or frustrated spin systems, are difficult numerical problems which, on classical hardware, usually rely on a quantum to classical mapping followed by analytic continuations back to the quantum regime. In the next future, there are serious hopes that these problems could be successfully tackled by new quantum algorithms tailored for quantum hardware and based on the Hamiltonian formulation. In this talk, I will first give an overview on the current state of quantum algorithms for the estimation of finite temperature expectation values of spin systems and lattice gauge theories. Then I will focus on describing the challenges introduced by non-abelian gauge theory computations in near-term quantum devices, and showing possible solutions.

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (ERC StrEnQTh grant agreement No 804305)



Contacts:

Department of Physics and Pitaevskii BEC Center

Phone: +39 0461 283848

Email: sara.rebecchi@unitn.it