

Nuclear and particle physics on a quantum computer: where do we stand now?

Report of Contributions

Contribution ID: 1

Type: **not specified**

Welcome and Introduction

Monday, 5 June 2023 09:15 (15 minutes)

Contribution ID: 2

Type: **not specified**

Hybrid Algorithms for Low Energy Nuclear Physics

Monday, 5 June 2023 09:30 (40 minutes)

Presenter: WENDT, Kyle (Law)

Contribution ID: 3

Type: **not specified**

TBD

Monday, 5 June 2023 15:10 (40 minutes)

Contribution ID: 4

Type: **not specified**

Quantum Algorithms for Simulating Nuclear Effective Field Theories

Monday, 5 June 2023 10:10 (40 minutes)

Presenter: WATSON, James (University of Maryland)

Contribution ID: 5

Type: **not specified**

TBD

Monday, 5 June 2023 14:30 (40 minutes)

Contribution ID: 6

Type: **not specified**

Real-time quantum Lanczos for nuclear structure

Monday, 5 June 2023 11:20 (40 minutes)

Presenter: JOHNSON, Calvin (San Diego State University)

Contribution ID: 7

Type: **not specified**

Nuclear shell-model simulation in digital quantum computers

Monday, 5 June 2023 12:00 (40 minutes)

Presenter: MARQUEZ ROMERO, Antonio (University of Barcelona)

Contribution ID: 8

Type: **not specified**

Quantum Simulation of Standard Model Physics

Tuesday, 6 June 2023 09:30 (40 minutes)

Presenter: SAVAGE, Martin (INT & University of Washington)

Contribution ID: 9

Type: **not specified**

Quantum Simulation of Lattice Gauge Theories in more than 1+1 D

Tuesday, 6 June 2023 10:10 (40 minutes)

Presenter: ZOHAR, Erez (Racah Institute of Physics, Hebrew University of Jerusalem)

Contribution ID: 10

Type: **not specified**

Quantum simulating non-Abelian lattice gauge theories: gauge invariance, point splitting, and magnetic interactions

Tuesday, 6 June 2023 11:20 (40 minutes)

Presenter: STRYKER, Jesse (University of Maryland, College Park)

Contribution ID: 11

Type: **not specified**

Trapped-Ion Quantum Simulation of Collective Neutrino Oscillations

Tuesday, 6 June 2023 12:00 (40 minutes)

Presenter: AMITRANO, Valentina (University of Trento, INFN-TIFPA)

Contribution ID: 12

Type: **not specified**

Lattice gauge theory with Rydberg atoms

Tuesday, 6 June 2023 14:30 (40 minutes)

Presenter: MEURICE, Yannick (University of Iowa)

Contribution ID: 13

Type: **not specified**

Quantum simulation of asymptotically free theories and theta terms

Tuesday, 6 June 2023 15:10 (40 minutes)

Presenter: SINGH, Hersh (University of Washington)

Contribution ID: 14

Type: **not specified**

Symmetry Breaking and Clock Model Interpolation in 2D Classical $O(2)$ Spin Systems

Wednesday, 7 June 2023 15:10 (40 minutes)

Presenter: HOSTETLER, Leon (Michigan State University)

Contribution ID: 15

Type: **not specified**

Quantum Error Correction with Gauge Symmetries

Wednesday, 7 June 2023 10:10 (40 minutes)

Presenter: RAJPUT, Abhishek (University of Washington)

Contribution ID: 16

Type: **not specified**

Improved Error Scaling for Trotter Simulations through Extrapolation

Wednesday, 7 June 2023 11:20 (40 minutes)

Presenter: WATKINS, Jacob (Michigan State University)

Contribution ID: 17

Type: **not specified**

Using symmetry breaking/restoration for many-body problem on quantum devices

Wednesday, 7 June 2023 12:00 (40 minutes)

Presenter: LACROIX, Denis (IJCLab-Orsay)

Contribution ID: 18

Type: **not specified**

Hardware-efficient quantum simulation of lattice gauge theories with neutral atom arrays

Wednesday, 7 June 2023 14:30 (40 minutes)

Presenter: GONZÁLEZ CUADRA, Daniel (University of Innsbruck, IQOQI)

Contribution ID: 19

Type: **not specified**

Extending the reach and capabilities of a superconducting quantum testbed for nuclear physics simulations

Wednesday, 7 June 2023 09:30 (40 minutes)

Presenter: NAIK, Ravi (Lawrence Berkeley National Laboratory)

Contribution ID: 20

Type: **not specified**

Entanglement and quantum simulations of nuclear systems in effective model spaces

Thursday, 8 June 2023 09:30 (40 minutes)

Presenter: ROBIN, Caroline (Uni Bielefeld and GSI Darmstadt)

Contribution ID: 21

Type: **not specified**

Coulomb interaction driven entanglement of electrons on helium, theory and experiment

Thursday, 8 June 2023 10:10 (40 minutes)

Presenter: HJORTH-JENSEN, Morten (Michigan State University (USA))

Contribution ID: 22

Type: **not specified**

Random measurements and entanglement for nuclear and particle physics exploration

Thursday, 8 June 2023 11:20 (40 minutes)

Presenter: MUELLER, Niklas (University of Washington)

Contribution ID: 23

Type: **not specified**

Testing Eigenstate Thermalization Hypothesis for Non-Abelian Lattice Gauge Theory

Thursday, 8 June 2023 12:00 (40 minutes)

Presenter: YAO, Xiaojun (University of Washington)

Contribution ID: 24

Type: **not specified**

Entanglement entropies in atomic nuclei within the nuclear shell model

Thursday, 8 June 2023 14:30 (40 minutes)

Presenter: PÉREZ-OBÍOL, Axel (Barcelona Supercomputing Center)

Contribution ID: 25

Type: **not specified**

Learning Hamiltonians in Quantum Simulation of Field Theories

Thursday, 8 June 2023 15:10 (40 minutes)

Presenter: OTT, Robert (Institute for Theoretical Physics, University of Innsbruck, 6020 Innsbruck, Austria, Institute for Quantum Optics and Quantum Information of the Austrian Academy of Sciences, 6020 Innsbruck, Austria)

Contribution ID: 26

Type: **not specified**

Squeezing the most performance out of quantum computers

Friday, 9 June 2023 10:10 (40 minutes)

Presenter: LAROSE, Ryan

Contribution ID: 27

Type: **not specified**

Superfluids of atoms and of light as quantum simulators of gravitational problems

Friday, 9 June 2023 09:30 (40 minutes)

Presenter: CARUSOTTO, Iacopo (INO-CNR BEC Center, Trento)

Contribution ID: 28

Type: **not specified**

Enabling Hybrid Classical-Quantum Computing

Friday, 9 June 2023 14:30 (40 minutes)

Presenter: CARLEO, Giuseppe (École polytechnique Fédérale de Lausanne (EPFL), Switzerland)

Contribution ID: 29

Type: **not specified**

Quantum simulation of lattice gauge theories in cold atoms and superconducting qubits

Friday, 9 June 2023 12:00 (40 minutes)

Presenter: HAUKE, Philipp (Pitaevskii BEC Center & INFN-TIFPA, University of Trento)

Contribution ID: **30**

Type: **not specified**

Closing remarks

Friday, 9 June 2023 15:10 (5 minutes)

Contribution ID: 32

Type: **not specified**

Efficient State Preparation Algorithms for the Schwinger Model

Friday, 9 June 2023 11:20 (40 minutes)

Presenter: PEDERIVA, Giovanni