

HPC and Quantum Computing – 3rd Edition

CINECA – Online event – 15 December 2020

Organizers: Daniele Ottaviani (CINECA), Enrico Prati (CNR-IFN), Riccardo Mengoni (CINECA)

10:00 – 10:10 Opening

Enrico Prati (CNR-IFN), Sanzio Bassini (CINECA)

Industries I: Chairman *Daniele Ottaviani* (CINECA)

10:10 – 10:40 Raffaele Mauro (Endeavor Italia)

Keynote on quantum industry

10:40 – 11:05 Michele Grossi and Cor Van Der Struijf (IBM)

Roadmap for Scaling Quantum Technology Adoption

11:05 – 11:30 Loic Henriet (Pasqal)

Quantum computing with neutral atoms

11:30 – 11:55 Andy Mason and Victoria Goliber (D-Wave)

Advantage, D-Wave's Next Generation Quantum Computing Platform

11:55 – 12:20 Ivano Pullano (Atos)

Atos Quantum program, 2021 updates

12:20 – 12:35 Daniele Ottaviani (CINECA)

Quantum Computing @ CINECA: Updates

12:35 – 13:30 Lunch

Universities I: Chairman *Riccardo Mengoni* (CINECA)

13:30 – 13:55 Davide Vodola (University of Bologna)

Fighting qubit loss in topological QEC codes: theory and experiment

13:55 – 14:20 Stefano Martina (University of Florence)

Machine Learning for Quantum Noise Benchmarking

14:20 – 14:35 Simone Notarnicola (University of Padua) (Short Talk)

Introduction to Tensor Networks as classical benchmark for quantum computation

14:35 – 14:50 Giuseppe Magnifico (University of Padua) (Short Talk)

Tree Tensor Networks approach for Lattice Gauge Theories

14:50 – 15:05 Kevin Mato (Polytechnic University of Milan) (Short Talk)

Quantum Molecular Unfolding

15:05 – 15:15 Break

Universities II. Chairman *Lorenzo Moro* (Polytechnic University of Milan)

15:15 – 15:40 Alessandro Crippa (Institute of Science and Technology Austria)
A spin qubit to interface semi and superconducting technologies

15:40 – 15:55 Iris Paparella (CNR-IFN, University of Milan) (Short Talk)
Digitally Stimulated Raman Passage for Qubit control by Deep Reinforcement Learning

15:55 – 16:10 Rudy Semola (CNR-IFN, University of Pisa) (Short Talk)
Quantum Control with Deep Reinforcement Learning on IBMQ backend using Qiskit Pulse

16:10 – 16:35 Virginia Carnevali (Central Michigan University)
D-Wave as a generator of structural models in materials science

16:35 – 17:00 Ilaria Siloi (University of Southern California)
Modeling order-disorder phase transitions with a quantum annealer

17:00 – 17:10 Break

Industries II Chairman *Enrico Prati* (CNR-IFN)

17:10 – 17:35 Gian Giacomo Guerreschi, Helena Liebelt (Intel)
Intel Quantum Simulator - a dive-in

17:35 – 18:00 Marta Mauri (Zapata Computing)
Quantum-Enhanced Machine Learning with Near-Term Devices

18:00 – 18:25 Annarita Giani (GE Research)
Quantum Annealing applied to an industrial logistics problem

18:25 – 18:50 Luca Asproni (Data Reply)
Data classification and forecasting with Quantum Machine Learning

18:50 – 19:15 Paul Finlay (Xanadu)
Photonic Quantum Computing in the Cloud

19:15 – 19:40 Simone Severini (AWS/UCL)
Democratizing Quantum Computing: Amazon Braket

19:40 – 19:50 Anna Grassellino (SQMS DOE National Quantum Information Science Research Center)
Final Highlights

19:50 – 20:00 Closing

Daniele Ottaviani (CINECA), Enrico Prati (CNR-IFN) and Sanzio Bassini (CINECA)

Workshop web page:

<https://eventi.cineca.it/en/events/quantum-computing-and-high-performance-computing-3rd-edition>