ICFO

WORKSHOP PROGRAM: Spring School on Open-Source Tools for Quantum Computing & Simulation

March 29, 2023 to March 31, 2023
ICFO Auditorium

Wednesday 29th of March

9:30 - 11:00? **Introduction to Quantum Computing using Qiskit - Part I,** with Marce Pfaffhauser (IBM)
After a general introduction to Quantum Computing, we will use Qiskit to let you write your first circuit!

11:00 - 11:30 COFFEE BREAK

11:30 - 13:00?????**Introduction to Quantum Computing using Qiskit - Part II,** with Marc l Pfaffhauser (IBM)
After a general introduction to Quantum Computing, we will use Qiskit to let you write your first circuit!

13:00 - 14:00 LUNCH BREAK

14:00 - 15:30 Theory and Practice of Superconducting Qubits, with Nicholas Bronn (IBM)
This lecture covers the physics of superconducting (transmon) qubits, their control and measurement, and considerations when mapping your quantum circuits to physical hardware.
15:30 - 16:00 COFFEE BREAK
16:00 - 17:30 Introduction to quantum simulation with cold atoms, with Antonio Rubio an Ramon Ramos (ICF
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Thursday 30th of March
9:30 - 11:00 Hands-on introduction to tensor network, with Joana Fraxanet and Niccol Baldelli (ICFO
MPS formalism, how to simulate a quantum circuit with MPS, benefit and limitations of the approach.
11:00 - 11:30 COFFEE BREAK
11:30 - 13:00???? Dynamic Circuits & error mitigation techniques, with Elisa Baeumer (IB
In this lecture I introduce dynamic circuits and their application to create long-range entanglement and discuss different error mitigation techniques for near-term quantum computing.i¿½
13:00 - 14:00 LUNCH BREAK
14:00 - 15:30???? Introduction/overview of quantum machine learning, with Paolo Stornati (ICFO)
15:30 - 16:00 COFFEE BREAK
16:00 - 17:30 Quantum optimization, with Almudena Carrera Vazquez (IB
It will be an overview of quantum optimization, and in particular of the research that we do on this area and its applications
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