

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II
DOTTORATO DI RICERCA / PhD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Seminar announcement

Friday, 12nd November 2021, Time: 10:30 - 12:30
Via Teams (Code: 39a8bp5)



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Possible Quantum Machine Learning Approaches in HEP

Abstract: We are at an exciting inflection point in quantum computing. The disciplines of quantum physics and quantum information science are mature to the point of producing several practical algorithms, and today's quantum computers can provide a concrete implementation with which we can explore the possibilities of these techniques. Thanks to its role in HEP and more broadly in European and international scientific research, CERN has compelling requirements for its future instruments and infrastructures. Quantum

computing is poised to potentially have an impact on machine learning methods. In this seminar, we will cover the current state and prospects of machine learning with quantum computers. This includes algorithms and models such as quantum kernel estimation, variational quantum classifiers, quantum neural networks, and quantum generative-adversarial networks. We will also demonstrate the capabilities of the Qiskit Machine Learning open-source software project.

Lecturer short bio: *Michele Grossi is a senior fellow in quantum computing at CERN. He received his industrial PhD in High Energy Physics from the University of Pavia. Michele has been working as Quantum Technical Ambassador at IBM and a Hybrid Cloud solution Architect. In his current role he co-supervises QML projects at CERN openlab. His focus is the development of QML pipelines HEP problems and their usage in different fields. He is actively collaborating with different research institutions and companies. In 2019 Forbes selected Michele as one of the top 30 under 30 young Italian leaders in enterprise technology.*

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