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# Quantum Machine Learning in High Energy Physics

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Theoretical and algorithmic advances, availability of data, and computing power have opened the door to exceptional perspectives for application of classical Machine Learning in the most diverse fields of science, business and society at large, and notably in High Energy Physics (HEP). In particular, Machine Learning is among the most promising approaches to analyse and understand the data the next generation HEP detectors will produce.

Machine Learning is also a promising task for quantum devices that can leverage compressed high dimensional representations and use the stochastic nature of quantum measurements as random source. Several architectures are being investigated. Quantum implementations of Boltzmann Machines, classifiers or Auto-Encoders, among the most popular classical approaches, are being proposed for different applications. Born machines are purely quantum models that can generate probability distributions in a unique way, inaccessible to classical computers. This talk will give an overview of the current state of the art in terms of Machine Learning on quantum computers with focus on their application to HEP.

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**Session Classification:** Session 4.3