



COLLOQUIA DI DOTTORATO, A.A. 2024/2025

A101, Dipartimento di Fisica
Giovedì 16 gennaio 2025 ore 16:00

Quantum Observables in High Energy Physics

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Quantum Mechanics (QM), one of the most counter-intuitive and vanguard descriptions of fundamental phenomena ever conceived, is not only at the heart of our understanding of the Universe, of matter, and of its interactions, but has also gained a primary role in science and technology with a large range of applications to our everyday life going from computing, to information theory, to safe communications. While we currently have no motivation to think that QM would stop to describe phenomena at short distances, at least below the Planck scale, it is interesting to ponder to what extent fundamental quantum effects can be probed beyond the atomic scales (10^{-10} m). Such a question has recently gained further momentum after the observation of entanglement in the spin of top/anti-top quark pairs at the LHC, the highest energy accelerator experiment on earth, operating at the TeV (10^{-19} m, 10^{-28} s) scale.

This seminar will review the main ideas and results of applying quantum information concepts and methods to the study of fundamental interactions and illustrate the perspectives.

The seminar is in presence up to the maximum occupancy of the lecture hall.