UNIVERSITÀ DI PAVIA
Dipartimento di Fisica
"Alessandro Volta"

Dottorato di Ricerca in Fisica

COLLOQUIUM INAUGURALE DEL DOTTORATO IN FISICA, A.A. 2026/2027

Aula VII di Lettere, Palazzo Centrale

Giovedi 29 ottobre 2026 ore 16:00

Quantum theory, measurement and relativity

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Undergraduate courses in quantum mechanics pay a lot of attention to the rules for measurement, often presented in terms of an instantaneous collapse of the state vector. Meanwhile, undergraduate courses in special relativity make a point of the relativity of simultaneity. With this in mind, one might expect that courses in quantum field theory (QFT), which combines quantum theory and relativity, would address this apparent contradiction - but instead one encounters silence on the matter. In this lecture, it will be explained why the topic of measurement in quantum field theory presented more problems than solutions for many years, and describe a recently developed framework that clarifies how (and why) states should be updated in QFT following measurements, and which has among other things resolved the long-standing problem of "impossible measurements". The framework fits within an approach to QFT called algebraic quantum field theory, which will be discussed. No prior knowledge of QFT is assumed.

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