

QUANTUM MECHANICS AND BEYOND

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Sala Cappella ex Ospedale Militare

Via Fabio Severo 40, Trieste and on Zoom

“Quantum Mechanics is certainly an imposing theory. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the old one”, Einstein famously wrote in a letter to Born in 1926. Since Einstein’s times we have learnt a lot about quantum theory, yet his puzzlement has resisted over the years, and nowadays an increasing number of scientists, among whom several Nobel prize winners, endorses it.

However, with some surprise, it seems that the outcome will not be as expected by Einstein. We will present Einstein’s objections to quantum theory by discussing two main topics, which will bring us to the very foundations of quantum mechanics: one is quantum nonlocality, which creates a conflict with special relativity. The other one is the so called measurement problem, whose solution requires a reformulation of the theory... or perhaps a brand new theory.