Teleportation at CosmoCaixa

Prof. Antonio Acin reviews speculation and experiments on teleportation at the Barcelona Science Museum.

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ICFO group leader and ICREA Research Professor Antonio Acin explained the historical evolution and recent advances in teleportation to the general public in a conference at CosmoCaixa (Barcelona Science Museum). The event is part of a series devoted to science-fiction ideas that have come true.

At the beginning of the 20th century, with the advent of Quantum Mechanics a great revolution took place in the field of physics. The new theory not only managed to explain some of the experiments that had not been understood until that time but also predicted results that escaped classic intuition. Imaginary experiments (*Gedankenexperiment*, in German) played a fundamental role in this development. Surprising situations predicted in these experiments were still compatible with the theory framework; however, it was

impossible to actually put them into practice. But nowadays the most surprising Quantum Mechanics predictions are not beyond the range of real-world experiments. The majority of quantum effects in Nature can now be controlled and therefore used. This change of paradigm is clearly reflected in the birth of Quantum Information Theory, a discipline that studies how to transmit information coded in quantum states. Quantum computation, teleportation and quantum cryptography are the most prominent results of this theoretical and experimental effort.