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Quantum Mechanics, entanglement, the Universe, vacuum and particles

The development of the Quantum Experiments at Space Scale (QUESS) program is reviewed, and its present status is discussed in detail including all possible error bars and their implications for entanglement. Deviations from standard Quantum Mechanics can possibly be detected in this way.

Attention is also devoted to the astrophysical and cosmological consequences of the present evolution of instruments, measurements and results. The potential role of the physical vacuum is simultaneously discussed, as well as implications for particle physics.

Quantum teleportation in the new scenario implying in particular Ngari and Micius as studied by the authors of the satellite program is also analyzed, together with its practical consequences and technological prospects. Possible new physics is equally considered in this respect.

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