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[back to namelist](#)

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Cosmic inflation allows for local determinism in quantum mechanics

Among the most exotic features of quantum mechanics are the violations of local realism shown by Bell's theorem, and of classical noncontextuality shown by the Kochen- Specker theorem and others.

Each of these theorems depends on a randomly chosen measurement which in turn has a random outcome, and it is correlation among these possible outcomes that displays nonclassicality. It is shown that cosmic inflation of space-time from a singular point can be seen to alter the conditions of local realism and noncontextuality such that quantum mechanics no longer predicts that they be violated.

To obtain this conclusion, the causality structure of an experiment to measure Bell's theorem is examined in detail, and the new role of cosmic inflation is explained. The analysis is then easily extended to the question of noncontextuality. It is ultimately shown that locally deterministic dynamics can describe all possibilities in quantum mechanics, even though outcomes are still random.

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