



CICLO DE CONFERENCIAS HABLEMOS DE FÍSICA



FACULTAD DE CIENCIAS FÍSICAS

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New prospects for experimental nanoscience

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When in 1985 Leggett and Garg asked the question “Is the flux there when nobody looks”, they stimulated a quest to test their inequality which for nearly a quarter of a century eluded experimentalists. Eventually a number of experiments were performed, including our own, which in varying degrees fulfilled the required conditions. In due course we extended this to avoid any detectable disturbance from the back-action of quantum measurements, in an experiment that was equivalent to a test of noncontextuality.

The inequality provided a rigorous test for one way in which at some level some non-quantum mechanical principles might intervene. Where else might one look for quantum theory to break down? Good places might be where some kind of spontaneous collapse might occur, or where gravitational effects become significant. Another place where new principles might occur, albeit entirely consistent with quantum theory, is where the concept of information plays a causal role in non-equilibrium thermodynamics.

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