



DEPARTAMENTO DE
ANÁLISIS MATEMÁTICO



Seminario de QI

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**“A glance beyond the quantum model”
(Based on the paper: arXiv:0907.0372)**

Abstract:

One of the most important problems in Physics is how to reconcile Quantum Mechanics with General Relativity. Some authors have suggested that this may be realized at the expense of having to drop the quantum formalism in favor of a more general theory. However, as the experiments we can perform nowadays are far away from the range of energies where we may expect to observe non-quantum effects, it is difficult to theorize at this respect. Here we propose a fundamental axiom that we believe any reasonable post-quantum theory should satisfy, namely, that such a theory should recover classical physics in the macroscopic limit. We use this principle, together with the impossibility of instantaneous communication, to characterize the set of correlations that can arise between two distant observers. Although several quantum limits are recovered, our results suggest that quantum mechanics could be falsified by a Bell-type experiment if both observers have a sufficient number of detectors.

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