

# Decoherence and Open Quantum Systems

Even in the most sophisticated experimental laboratories, quantum systems are unavoidably affected by the surrounding environment. Such an action can overtake the effects one desires to observe. Besides phenomena like dissipation and approach to thermal equilibrium, which are also present in classical systems, in the context of open quantum systems environmental decoherence plays the most significant role. This is indeed responsible for the loss of the quantum coherence and thus of the quantum traits of the system dynamics. To reduce the environmental action on the system, it is essential an accurate derivation and characterization of effective equations of motion embedding such effects.

The group works on modelling and quantifying these phenomena and, in liaison with experimental collaborators, aims at testing them. A recently developed model concerns gravitational decoherence [1], where gravity plays the role of the environment causing the loss of quantum coherence.

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## References:

- [1] A. Bassi *et al.*, *Class. Quantum Grav.* 34, 193002 (2017); M. Carlesso and A. Bassi, *Phys. Lett. A*, 380, 31-32 (2016).