

# Atomic and Laser Physics Seminar

Monday, 21 January

11.30

Audrey Wood Seminar Room

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*“Un coup de dé”: quantum measurements as a tool for quantum information processing*

Photons are almost ideal quantum information carriers: their resilience to the external world preserves the coherence of the information which can be coded. Nevertheless, this also implies that direct multi-photon interactions are extremely hard to implement at the single-photon level. However, such interactions are necessary to realise quantum logic gates. Knill, Laflamme and Milburn have demonstrated that such interactions can be obtained based on linear optics elements, such as beam splitters and phase shifters, and conditioning on the outcome of a measurement. In this talk, we will present some recent progresses in the development of quantum gates inspired by the original proposition of KLM. In particular, we will discuss the application of such method to the manipulation of continuous-variable systems with the implementation of a non-deterministic noiseless amplifier.