

## Probing Many-Body Localisation from an Ultracold Atom Perspective

*mardi 14 juin 2016 09:30 (45 minutes)*

A fundamental assumption in statistical physics is that generic closed quantum many-body systems thermalise under their own dynamics. Recently, the emergence of many-body localised (MBL) systems has questioned this concept, challenging our understanding of the connection between statistical physics and quantum mechanics. In my talk, I will report on several recent experiments carried out in our group on the observation of Many-Body Localisation in different scenarios, ranging from 1D fermionic quantum gas mixtures in Aubry-André type disorder potentials to 2D systems of interacting bosons in 2D random potentials. It is shown that the memory of the system on its initial non-equilibrium state can serve as a useful indicator for a non-ergodic, many-body localised phase.

Our experiments represent a demonstration and in-depth characterisation of many-body localisation, often in regimes not accessible with state-of-the-art simulations on classical computers.

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**Classification de Session:** Morning Session1