

Meetings of the Belgian Quantum Physics Initiative

Colloquium



Prof. Jean Dalibard

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Exploring Flatland with cold atoms

The physics of many-body systems strongly depends on their dimensionality. With the realization of quantum wells for example, it has been possible to produce two-dimensional gases of electrons, which exhibit properties that differ dramatically from the standard three-dimensional case. During the last decade, a novel environment has been developed for the study of quantum physics in low dimension. It consists of cold atomic gases confined in tailor-made light traps, forming a thin layer of material particles. In this talk I will present some interesting aspects of the physics of such 2D fluids, in relation with their scale invariance. In particular I will illustrate their dynamical symmetry, which can be revealed when they are set out-of-equilibrium. I will also show that there exist specific initial shapes that lead to a periodic evolution of these gases, corresponding to "breathers" of the two-dimensional Gross-Pitaevskii equation. I will conclude with a possible generalization of such unexpected phenomena to other scale invariant fluids.

Thursday 14th MARCH 2019 AT 2.00 P.M.

COFFEE AND TEA WILL BE SERVED AT 3.00 P.M.

Two short talks will follow:

4pm: Prof. Thierry Bastin (Univ. Liege)

« Magneto-optical trapping of Iron atoms »

4:30pm: Dr. Kristof Moors (KU Leuven)

« Non-Hermitian topological phases in nodal-line semimetals »

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