SUMMER LECTURE: Simulating quantum problems with ultracold atoms

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Blue Lecture Room

In the past decades it has become possible to cool down atomic gases which are about a million times thinner than air to temperatures about a billionth of a degree above absolute zero. At such ultracold temperatures, the atoms enter the quantum degenerate regime and can be used as a new and very malleable form of quantum matter with which models from different fields of physics can be explored. This approach is known as quantum simulation and allows one to investigate problems ranging from material science to high energy physics in the same table-top experiment. In my talk, I will introduce this field of research, present a few examples of quantum simulations carried out in our group at ICFO, and discuss future perspectives.?

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