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Quantum science with cold atoms at ICCUB

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Cold neutral atoms constitute a highly controllable platform for studying complex quantum phenomena as well as for developing quantum technology. Some examples of their applications include atomic clocks, quantum computation and simulation, and the testing of fundamental physics. In recent years, the detection and manipulation of atoms at the individual level have pushed forward many directions in the field. A major example can be found in quantum-gas microscopes, which enable the direct characterization of strongly correlated quantum many-body systems.

In this talk, I will begin by giving an introduction to the field of cold atoms, discussing concepts like laser cooling and optical trapping. I will then focus on their use as quantum simulators, based on some of my previous experimental research works. In the final part of the talk, I will present the first steps toward establishing the first cold-atom experiment at the Universitat de Barcelona.

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