Scholarship

Topic: Quantum Simulation with cOLD Atoms - QOLD
Q@TN
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Synthetic description of the activity and expected research outcome Ultracold atomic gases are promising platforms for studies of quantum many-body physics and for the quantum simulation of important models of high-energy physics and gravitation. They allow for a great flexibility in designing scalar trapping potentials and synthetic magnetic field for atoms, in tuning atom-atom interactions, and in manipulating the internal state of the atom via optical, micro- and radio-wave fields, hence allowing the realization of crucial models in quantum condensed matter physics. From an interdisciplinary point of view, crucial steps were the realization of sonic black holes in flowing atomic condensates and the first experimental evidence of analog Hawking radiation processes. The PhD student will work on these subjects from both the experimental and theoretical sides, having access to the already operational experimental facilities and contributing to the realization of a novel experimental apparatus aiming at quantum simulation with Rydberg atoms.
Ideal candidate (skills and competencies)**:** The ideal candidate should posses good knowledge of quantum mechanics, statistical physics, atomic physics with applications to data analysis and experimental research. The PhD student will work in the interdisciplinary environment of the BEC Center (http://bec.science.unitn.it) where research both on experiments and theory is done covering a wide range of themes.