

Abstract Submitted  
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**Bose - Einstein condensation in quantum glasses** GIUSEPPE CARLEO, SISSA and CNR-INFM DEMOCRITOS - Trieste, Italy, MARCO TARZIA, LPTMC, Universite Pierre et Marie Curie - Paris, France, FRANCESCO ZAMPONI, LPT, Ecole Normale Superieure - Paris, France — A “superglass” is a phase of matter which is characterized at the same time by superfluidity and a frozen amorphous structure. Latest experimental and numerical evidence of a metastable superglass Helium 4 has stimulated research in the direction of a satisfactory microscopical characterization of this novel phase. I will review a recent theoretical approach to model the problem [Carleo, Tarzia and Zamponi arXiv:0909.2328, in press on PRL], where we have shown that geometrical frustration plays a prominent role in the stabilisation of Bose-Einstein condensation in quantum glasses. I will describe the physical insights offered by a model of strongly interacting bosons on a frustrated lattice, showing the main differences with the otherwise insulating “Bose glasses.” The solution of the model by means of recently introduced methods, namely the Quantum Cavity Method and the Canonical Worm Algorithm, will also be discussed. In the last part, I will focus on possible routes to new experiments with cold atoms.

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