



UNIVERSITA' DEGLI STUDI DI PAVIA

DOTTORATO DI RICERCA IN FISICA

COLLOQUIA 2018-2019

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Aula 102 "L. Giulotto", ore 16.00

Dipartimento di Fisica, via Bassi 6, Pavia

Quantum Simulators

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Abstract: According to Feynman the best way to simulate a complex quantum system is to use another quantum system. When realised, a quantum simulator might become an amazingly efficient tool to study a variety of quantum many-body systems. After so many years from Feynman's proposal the level of experimental control on certain quantum many-body systems became such that Feynman's vision has become reality. At present there are a number of platforms, ranging from cold atoms in optical lattices to trapped ions and solid state nano-circuits that are best suited to this aim. Together with the impressive progresses in the new emerging quantum technologies, a large body of theoretical work has shaped and widened considerably the field of quantum simulations. Numerous experimental and theoretical works found applications of quantum simulators in a wide range of fields from condensed-matter physics to high-energy physics, from quantum chemistry to cosmology.

In my presentation I will give a general overview of the present activity in this field. I will highlight some of the potentialities of quantum simulators together with look into the future with a discussion of some open problems.

