ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ & ΝΑΝΟΤΕΧΝΟΛΟΓΙΑΣ/ CCQCN SEMINAR

Tuesday, 19 May 2015

12:30-13:30

3rd Floor Seminar Room

From synthetic gauge field to lattice gauge theories in cold atom quantum simulators

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Abstract

After reviewing idea and motivations for Quantum Simulation. I will introduce the simulation of synthetic (background) gauge fields with ultracold atoms as paradigmatic example. Such Quantum Simulators allow to study Quantum Hall effects, as well as the simulation of relativistic physics and other topological systems. Of all the possible strategies devoloped in order to engineer synthetic gauge fields, I will detail the one based on "synthetic dimensions" that we introduced and has been recently experimentally realized in two different experiments. In the last part of the talk I will briefly discuss how it is possible to simulate (certain) Lattice Gauge Theories, i.e. models in which the synthetic gauge field becomes dynamical and quantum.