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Workshop or Conference

Lundi 11 Juin 2018, 00 :00
IPHT, Amphi Claude Bloch, Bât. 774(https ://topmat.sciencesconf.org/)
Domaines : physics

Titre : *Topological phases of matter : from the quantum Hall effect to spin liquids (Topmat) June 11th - July 6th, 2018*

Orateur : **... (IPhT)**

Résumé : *The understanding of collective quantum phenomena in condensed-matter systems has been a central topic in physics, since the beginning of the 20th century and the discovery of superconductivity and superfluidity. For some long period of time, two important ideas lead the understanding of the quantum states of matter : the Ginzburg-Landau theory of phase transitions (based on [broken]symmetries and their associated order parameters), and the Landau theory of Fermi liquids (based on weakly interacting quasi particles). But since the discovery of the quantum Hall effects in the eighties, it has been understood that many materials realize some new states of matter that cannot be characterized using conventional (Landau) order parameters and for which some fundamentally different approaches are required. In most of them, topology is playing a crucial role. These new phases, and the associated theoretical tools, are not only relevant to describe the low temperature phases of the electrons (or their spins) in some particular solids, but they are also relevant to some "artificial" quantum systems, such as trapped cold atoms or nanofabricated superconducting arrays, which both could be engineered to realize some topological phases. All these systems are both fascinating from a conceptual point of view, as they challenge our views on many-particle systems and quantum mechanics, but they could also lead to new types of devices and applications.*

During this program, we plan to focus on interacting topological phases of matter, and on the fractional quantum Hall states and quantum spin liquids in particular.

The goal is to gather some experts in the field to discuss the latest theoretical and experimental developments, and to favor new collaborations.

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