SEMPARIS – Séminaires en région parisienne

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Cours

Mardi 3 Décembre 2019, 10 :00
IPHT, Salle Claude Itzykson, Bât. 774(https ://courses.ipht.cnrs.fr/ ?q=fr/node/245)
Domaines : cond-mat

Titre : *Topological Phases of Matter (5/6)*

Orateur : **Cristina Bena And Thierry Jolicoeur (IPhT)**

Résumé : *In this series of lectures we will give a broad view of topological systems, including topological insulators, quantum Hall effect, and topological superconductors. We will discuss the properties of Majorana states and other topological edge states in both one-dimensional and two-dimensional systems, as well as the techniques to study the formation of these states and their properties.*

Integer and fractional quantum Hall effects will be discussed notably using the composite fermion contruction of wavefunctions. We will describe fractional charge and statistics of the quantum Hall states and their effective field theoretic description. The pfaffian state proposed to describe the elusive $\nu = 5/2$ *state will be also decribed.*
The program of the lectures will include :
1- Topology in solid state systems ; Examples of topological materials and topological edge states (e.g. Majorana)
2- Analytical and numerical techniques to derive the formation of edge states
3- 2D electronic systems, Landau levels, integer and fractional quantum Hall effect
4- The Laughlin wavefunction, more fractions composite fermions
5- Multicomponent systems : spins and interlayer phase coherence, quantum Hall ferromagnetism
6- The pfaffian state and its excitations.
