



Contribution ID: 51

Type: **Invited Speaker / Conférencier invité**

## **Spin-orbit coupling + Interaction = ?**

*Monday 16 June 2014 13:45 (30 minutes)*

Strongly interacting electron systems have fascinated the condensed matter community for a few decades. The addition of interactions to a model leads, in many cases, to new kinds of states, especially in low dimensional systems where fluctuations are pronounced. Notable examples are unconventional superconductivity and the fractional quantum Hall effect.

Spin orbit coupling, on the other hand, has been in the spotlight in recent years due to its important role in topological insulators and superconductors. It is responsible to the non-trivial topology of topological insulators in two and three dimensions.

It is therefore tempting to ask what is the combined effect of electron-electron interactions and spin orbit coupling. In this talk I will discuss several models which include these two ingredients. The resulting behaviour ranges from incommensurate spin density wave to a strongly correlated topological superconductor. I will discuss the challenges of characterizing these topological many body states.

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**Session Classification:** (M1-1) Topological States of Matter - DCMMP / États topologiques de la matière - DPMCM

**Track Classification:** Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)