

Quantum Spin Hall Effect

Alvaro Díaz Fernández

Departamento de Física de Materiales

Facultad de Físicas

Universidad Complutense

In 2006, Kane and Mele predicted the existence of a new phase of matter that has boosted the research in topological materials ever since. Based on the works of Haldane on the quantum anomalous Hall effect, these researchers were able to identify the so-called quantum spin Hall effect, a system displaying topologically protected currents at the edges of the sample. These currents have the remarkable property of being spin-polarized.

This three-day mini-course will cover the basics of the quantum spin Hall effect. We will start with an introduction to the father of all topological phenomena, the quantum Hall effect, where we will delve into the mysterious quantization of the Hall conductance. The next session will cover the first attempts that eventually led to the discovery of the quantum spin Hall effect by Kane and Mele. To this end, we will play with the symmetries of the world-famous graphene. Finally, the last session will cover the theoretical prediction by Bernevig and collaborators and the subsequent experimental detection by the group of Prof. Molenkamp of the quantum spin Hall effect in HgTe quantum wells.

Más información: Enrique Díez –enriza@usal.es

Días: 27, 28 y 29 de junio de 2017

Hora: 12:00 – 13:30 horas

Lugar:

**Aula 11.3 – 1ª planta –
Edificio I+D+i de la Universidad de Salamanca.
C/ Espejo, s/n. 37008 Salamanca**