

DEFENSA TESIS DOCTORAL

Fabrication and characterization of Quantum Materials: Graphene heterostructures and Topological Insulators

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Starting from a detailed description of the Nanotechnology Clean Room facilities at the University of Salamanca, installed during this thesis work, we report different fabrication processes we have developed to exploit high-quality graphene and 2D-material-based nanostructures.

We will present high-mobility samples exhibiting ballistic transport up to 5 microns distance allowing us to achieve the Fractional Quantum Hall regime at low temperature and the Integer Quantum Hall effect even at room temperature.

During the dissertation we will show a detailed study of the transport properties in graphene quantum point contacts. Particularly, we have introduced a new cryo-etching method to obtain low roughness edges nanoconstrictions in encapsulated graphene where well-defined plateaus of conductance have been clearly observed stemming from size quantization.

Finally, transport measurements on topological insulator materials like InAs/GaSb double quantum wells with different bandgap configurations (inverted, normal or critical) will be presented. We will focus in a exotic state of matter, the Excitonic Insulator, that will shed some light on our results.

Día: Martes, 11 de febrero de 2020

Hora: 11:00 horas

**Lugar: AULA FRANCISCO DE SALINAS
ESCUELAS MAYORES (EDIFICIO HISTÓRICO)**