Polarized electron transport in inhomogeneous magnetic microstructures and localization in the integer quantum hall regime

Fact Sheet

Project Information

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Project closed

Start date
21 October 1996

End date
20 October 1998

Funded under
Specific research and technological development programme in the field of the training and mobility of researchers, 1994-1998

Total cost
No data

EU contribution
No data

Coordinated by
THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD
United Kingdom

Objective

In the first part of this project we will study the spin-dependent transport of electrons across a ferromagnet-semiconductor (FS) interface. The presence of a potential barrier (Schottky barrier) at the FS interface will also be addressed. Next, we plan to thoroughly study the injection of spin-polarized electrons into a two dimensional electron gas at the semiconducting side of the interface by considering in detail many-body effects like exchange and correlation. By allowing for spin channel mixing at finite temperatures via electron-magnon scattering our calculations will provide a basis for understanding the room temperature giant magnetoresistance effect.
In the second part we will focus on the localization transition in the Integer Quantum Hall effect. In our calculation both types of disorder (on scalar and vector potential) will be included on equal footing by adopting a lattice model of spin- less fermions the low energy physics of which is described by a free particle Dirac equation. Within our model the edge state problem, and the tunneling among transmission edge channels, will be addressed in detail.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > theoretical physics > particle physics > **fermions**

Programme(s)

FP4-TMR - Specific research and technological development programme in the field of the training and mobility of researchers, 1994-1998

Topic(s)

0302 - Post-doctoral research training grants

TP09 - Condensed Matter - Mechanical and Thermal Properties

Call for proposal

Data not available

Funding Scheme

RGI - Research grants (individual fellowships)

Coordinator

THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD

EU contribution

No data

Total cost

No data

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Participants (1)

Not available

Greece

EU contribution

No data

Address

Total cost

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