Dottorato di Ricerca in Fisica

(XLI Ciclo)

Proposta di Progetto di Ricerca

Multiferroic heterostructures for electrical control of magnetism and quantum transport

Multiferroic heterostructures, where separate layers with electric and magnetic long range orders are interfacially coupled, have great potential for electrical control magnetism at room temperature, and hence for low power electric-write magnetic memories. We have been working on magnetoelectric multiferroic heterostructures for a number of years and the doctoral candidate will build on our expertise to address two novel heterostructures, namely:

1. *Multiferroic and magnetolectric heterostructures for quantum transport*: in the frame of the PRIN Project BEAT, the candidate will study multiferroic heterostructures comprising magnetic topological insulators. Work will be carried out in collaboration with PRIN partners POLIMI and CNR-Spin together with the Department of Materials Science of the University of Cambridge and Diamond Light Source (both of which are external collaborators in the PRIN Project).
2. *Multiferroic heterostructures that are both magnetoelectric and "multicaloric"*: incorporating magnetocaloric materials in our most recent and novel magnetoelectric heterostructures, the candidate will produce multifunctional heterostructures.

All the work will be in the frame of the 5-year long "Progetto di Ateneo UNIPR- Diamond Light Source", that grants regular access to our group to the Diamond Light Source synchrotron and to highly specialized facilities in Cambridge.

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