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Phd program in Chemical and Material Sciences XXIX cycle

Phd Thesis Defense

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Growth characterization and patterning of magnetic thin films for spintronics application

Candidate:

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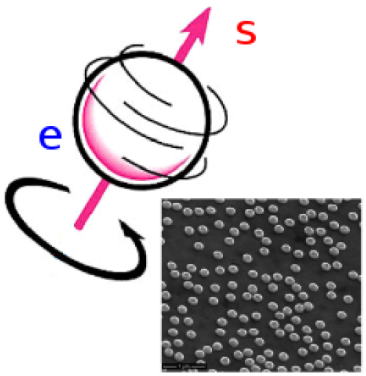

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Abstract:

The word spintronics is a compound meaning spin transport electronics: the unifying effort offered by this field of research is between magnetism and the related technologies and the huge field of electronics. Behind this new term there is a multidisciplinary community having the ultimate goal of manipulate the spin degree of freedom in solid state systems, as we currently do with the electron charge. In this thesis the field of spintronics will be approached by the investigation of two different branches: The experimental study of the the diluted magnetic semiconductor $Ge_{1-x}Mn_x$ will be presented; starting from the synthesis of the material, going through the characterization of its physical properties and concluding with the interpretation of the results done in the light of the existing theoretical models. Particular emphasis will be addressed to the magnetic characterization through the use of superconducting quantum interference magnetometers (SQUID) and on the material synthesis. The second part will be devoted to the synthesis of patterned magnetic nanostructures, by means of bottom up and top down lithographic approaches, for measurements of spin waves propagation using the inductive microwave technique.