Session 25W

Spin Electronics : results and perspective **25W1**

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Spin Electronics (also called Spintronics)refers to a class of effects obtained in Magnetic Nanostructures by exploiting the influence of the spin on electron transport. A first example of spin electronics effect is the giant magnetoresistance of the magnetic multilayers, discovered at the end of the eighties and now applied in most read heads of hard discs. Spin electronics has rapidly extended from the domain of the metallic multilayers and the today heterostructures combine metals, insulators or semiconductors. Spin polarized tunneling poses interesting fundamental problems and is very promising for applications (M-RAM). Developing feromagnetic/semiconductor heterostructures to combine spin electronics and conventional electronics is also an important challenge.Finally the possibility of reversing magnetizations not by an applied field but by injecting spins can lead to very general applications in nano-magnetic devices.

Superconductivity under high pressure **25W2**

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Experimental results of research for pressure-induced superconductivity performed by Osaka groups are shortly reviewed as well as techniques employed in the complex extreme conditions of very low temperatures and ultra-high pressure. Typical examples of simple system such as elemental materials, ionic crystals, organic crystals and heavy fermion systems are shown and discussed. Special attention will be paid for our recent results in the case of magnetic materials under pressure.