While applications of GMR and TMR are already on the market, spintronics is now developing in interesting new directions. I will review some recent developments:

1. **SPIN TRANSFER**: The magnetic moment of a ferromagnetic element can be re-oriented **WITHOUT APPLYING A MAGNETIC FIELD** but only by **TRANSFUSING SPINS** carried by an electrical current. This is the concept of spin transfer. I will describe experiments in which the magnetization is coherently reversed by spin transfer and others in which the spin transfer is used to move back and forth a magnetic domain wall. Spin transfer is very promising for the switching of sub-micronic devices like MRAM.

2. **SPINTRONICS WITH SEMICONDUCTORS**: Fusion between traditional electronics and spintronics in semiconductor/ferromagnetic heterostructures is a very attractive goal (for MRAM, for example, or for re-configurable devices). I will summarize the advances in this field.

3. **NANO-SPINTRONICS**: Spin polarized currents can be injected into a nanoparticle to combine Coulomb and spin blockade. This probes the spin coherence time in small particles (2-3 nm), which is the relevant information to assess the potential of spin-based qubits.