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Recent developments and perspective in spintronics

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Recent developments and perspective in spintronics: A. Fert, UMR CNRS/Thales, 91767 Palaiseau and Universit Paris-Sud, 91405 Orsay, France After an introduction on the fundamentals of spin transport and the discovery of GMR, I will focus on the most recent developments in spintronics. I will first describe the field of the spin transfer phenomena by reviewing experimental results on magnetic switching and generation of microwave oscillations by spin transfer. The synchronization and phase locking of a collection of STOs (Spin Transfer Oscillators) is an example of new important problem raised by the experiments of spin transfer. I will present data on the synchronization of electrically connected STO. I will then continue the review with results on spintronics with semiconductors, molecular spintronics and spin Hall effect.

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