



Istituto Elettrotecnico Nazionale Galileo Ferraris, Torino, Italy



Materials Department

Research Scientists

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The research activity in the Materials Department promotes the harmonization and cross-feeding of the studies carried out in various domains of investigation: materials preparation, structural and magnetic characterization, basic investigation and physical modeling, applications. The complexity of the problems to be approached and the array of technical means required to investigate novel and conventional materials have strongly favoured the establishment of national and international cooperations. This has resulted in a wide array of research themes on a range of materials. All researches are solidly supported by established [calibration and measurement capabilities](#), traceable to physical and written standards. Training and diffusion of knowledge in magnetism and magnetic materials are pursued through courses, seminars, and workshops.

The research activity of the Materials Department is focused on the following themes:

- Preparation and characterization of rapidly quenched materials and magnetic thin films.
- Experimental and theoretical study of the magnetization process in soft and hard magnetic materials.
- Magnetic hysteresis: hysteresis loops, the Barkhausen effect, thermal relaxation phenomena.
- Magnetization dynamics: eddy currents and high frequency behavior of ferromagnets.
- Magnetic measurements and standards.
- Standards in electrolytic conductivity.

Three recent publications:

- 1) G. Bertotti, C. Serpico, I.D. Matergoyz, A. Magni, M. d'Aquino, and R. Bonin: *"Magnetization switching and microwave oscillations in nanomagnets driven by spin-polarized currents"*, Phys. Rev. Lett. 94 (2005) 127206-1 / 127206-4.

- 2) P. Allia, M. Coisson, J. Moya, V. Selvaggini, P. Tiberto, F. Vinai: *Magnetoresistance and nanoscopic magnetic coherence in some frustrated ferromagnets*. *Physical Review B*, Vol. 67, p. 174412-1/174412-8
- 3) F. Fiorillo: “*Measurement and characterization of magnetic materials*” (New York: Elsevier-Academic Press, 2004), 647 Pages, 10 Chapters, 243 Figures, 28 Tables