

1. Record Nr.	UNINA9910830189003321
Titolo	Introduction to magnetic random-access memory // edited by Bernard Dieny, Ronald B. Goldfarb, Kyung-Jin Lee
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley-IEEE Press, , [2017] [Piscataway, New Jersey] : , : IEEE Xplore, , [2017]
ISBN	1-119-07935-7 1-119-07941-1
Descrizione fisica	1 online resource (263 pages) : illustrations
Collana	IEEE magnetics
Disciplina	004.5/3
Soggetti	Magnetic memory (Computers)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Basic Spintronic Transport Phenomena / Nicolas Locatelli, Vincent Cros -- Magnetic Properties of Materials for MRAM / Shinji Yuasa -- Micromagnetism Applied to Magnetic Nanostructures / Liliana D Buda-Prejbeanu -- Magnetization Dynamics / William E Bailey -- Magnetic Random-Access Memory / Bernard Dieny, I Lucian Prejbeanu -- Magnetic Back-End Technology / Michael C Gaidis -- Beyond MRAM: Nonvolatile Logic-in-Memory VLSI / Takahiro Hanyu, Tetsuo Endoh, Shoji Ikeda, Tadahiko Sugibayashi, Naoki Kasai, Daisuke Suzuki, Masanori Natsui, Hiroki Koike, Hideo Ohno -- Appendix: Units for Magnetic Properties.
Sommario/riassunto	Magnetic random-access memory (MRAM) is poised to replace traditional computer memory based on complementary metal-oxide semiconductors (CMOS). MRAM will surpass all other types of memory devices in terms of nonvolatility, low energy dissipation, fast switching speed, radiation hardness, and durability. Although toggle-MRAM is currently a commercial product, it is clear that future developments in MRAM will be based on spin-transfer torque, which makes use of electrons' spin angular momentum instead of their charge. MRAM will require an amalgamation of magnetics and microelectronics technologies. However, researchers and developers in magnetics and in microelectronics attend different technical conferences, publish in different journals, use different tools, and have different backgrounds

in condensed-matter physics, electrical engineering, and materials science. This book is an introduction to MRAM for microelectronics engineers written by specialists in magnetic materials and devices. It presents the basic phenomena involved in MRAM, the materials and film stacks being used, the basic principles of the various types of MRAM (toggle and spin-transfer torque; magnetized in-plane or perpendicular-to-plane), the back-end magnetic technology, and recent developments toward logic-in-memory architectures. It helps bridge the cultural gap between the microelectronics and magnetics communities.

---