

1. Record Nr.	UNINA9910437810603321
Titolo	Spintronics : from materials to devices // Claudia Felser, Gerhard H. Fecher, editors
Pubbl/distr/stampa	Dordrecht ; ; New York, : Springer, c2013
ISBN	90-481-3832-9
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (xxi, 369 pages) : illustrations (some color)
Collana	Gale eBooks
Altri autori (Persone)	FelserClaudia FecherGerhard H
Disciplina	621.381
Soggetti	Spintronics Magnetic materials
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Heusler compounds at a glance -- New Heusler compounds and their properties -- Crystal structure of Heusler compounds -- Substitution effects in double Perovskites: How the crystal structure influences the electronic properties -- Half-metallic ferromagnets -- Correlation and chemical disorder in Heusler compounds: a spectroscopical study -- Theory of the half-metallic Heusler compounds -- Electronic structure of complex oxides -- Local structure of highly spin polarized Heusler compounds revealed by nuclear magnetic resonance spectroscopy -- New materials with high spin polarization investigated by X-ray magnetic circular dichroism -- Hard X-ray photoelectron spectroscopy of new materials for spintronics -- Characterization of the surface electronic properties of Co ₂ Cr _{1-x} Fe _x Al -- Magneto-optical investigations and ion beam-induced modification of Heusler compounds -- Co ₂ Fe(Al _{1-x} Si _x) Heusler alloys and their applications to spintronics -- Transport properties of Co ₂ (Mn,Fe)Si thin films -- Preparation and investigation of interfaces of Co ₂ Cr _{1-x} Fe _x Al thin films -- Tunnel magnetoresistance effect in tunnel junctions with Co ₂ MnSi Heusler alloy electrode and MgO barrier.
Sommario/riassunto	Spintronics is an emerging technology exploiting the spin degree of freedom and has proved to be very promising for new types of fast electronic devices. Amongst the anticipated advantages of spintronics

technologies, researchers have identified the non-volatile storage of data with high density and low energy consumption as particularly relevant. This monograph examines the concept of half-metallic compounds perspectives to obtain novel solutions and discusses several oxides such as perovskites, double perovskites and CrO₂ as well as Heusler compounds. Such materials can be designed and made with high spin polarization and, especially in the case of Heusler compounds, many material-related problems present in current-day 3d metal systems, can be overcome. Spintronics: From Materials to Devices provides an insight into the current research on Heusler compounds and offers a general understanding of structure–property relationships, including the influence of disorder and correlations on the electronic structure and interfaces. Spintronics devices such as magnetic tunnel junctions (MTJs) and giant magnetoresistance (GMR) devices, with current perpendicular to the plane, in which Co₂ based Heusler compounds are used as new electrode materials, are also introduced. From materials design by theoretical methods and the preparation and properties of the materials to the production of thin films and devices, this monograph represents a valuable guide to both novices and experts in the fields of Chemistry, Physics, and Materials Science.
