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Titolo	Mesoscopic Phenomena in Multifunctional Materials : Synthesis, Characterization, Modeling and Applications // edited by Avadh Saxena, Antoni Planes
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Disciplina	620.5
Soggetti	Building materials Nanoscience Nanostructures Nanotechnology Physics Nanotechnology Structural Materials Nanoscale Science and Technology Applied and Technical Physics
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Multiferroics and multifunctionality: general aspects -- Electronic structure of multifunctional materials -- Thermodynamics of multiferroic-multifunctional materials -- Multifunctional nanoscale materials -- Multifunctional effects at interfaces -- Nanoscale phase transitions in multifunctional materials -- Room temperature multiferroics -- Spiral domains in multiferroics -- Morphotropic boundaries, domains and vortices in multiferroics -- Characterization of multifunctional thin films -- Modeling of the magneto-structural interplay -- Multifunctionality in glassy systems -- Multiscale numerical simulations -- High resolution imaging techniques -- Techniques for observing multifunctional domain walls -- Device applications of multifunctional materials.

A highly coveted objective of modern materials science is to optimize multiple coupled functionalities in the same single phase material and control the cross-response via multiple external fields. One important example of such multi-functionality are multiferroic materials where two or more ferroic properties are intrinsically coupled. They include, among others, the magneto-electric and magneto-structural materials, which are well understood at the nano- and continuum length (and time) scales. The next emerging frontier is to connect these two limiting scales by probing the mesoscale physics of these materials. This book not only attempts to provide this connection but also presents the state-of-the art of the present understanding and potential applications of many related complex multifunctional materials. The main emphasis is on the multiscale bridging of their properties with the aim to discover novel properties and applications in the context of materials by design. This interdisciplinary book serves both graduate students and expert researchers alike.
