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Nota di contenuto	Chapter 1: Sustainable Perovskite Multiferroic Materials: An Introduction -- Chapter 2: Synthesis techniques of perovskite multiferroic materials and their properties -- Chapter 3: Impact of doping, solid solution and composite formation mechanisms in sustainable perovskite multiferroic materials -- Chapter 4: Room temperature perovskite multiferroic materials bismuth ferrite (BiFeO <sub>3</sub> ): A highly investigated material in perovskite multiferroic material -- Chapter 5: Investigations of perovskite multiferroic materials by the first principle density functional theory approach: Structural, electronic, magnetic, optical and thermoelectric properties -- Chapter 6: Latest updates on low leakage and high rampancy issues in sustainable perovskite multiferroic materials -- Chapter 7: Detail investigations on the achievement of the exact mechanisms of the magnetoelectric

coupling in sustainable perovskite multiferroic materials -- Chapter 8: Quantum criticality in the sustainable perovskite multiferroic materials -- Chapter 9: Latest updates on the ultrathin films with robustly coupled ferroelectric–magnetic order parameters at room temperature -- Chapter 10: Perovskite multiferroics as energy harvesters: Exploring the multidimensional properties for energy harvesting applications -- Chapter 11: Latest updates on the enhancement in the photovoltaic energy conversion efficiency of sustainable perovskite multiferroic materials based solar cell devices -- Chapter 12: Sustainable perovskite multiferroic materials for spintronic applications -- Chapter 13: Sustainable perovskite multiferroic materials for memristive memory and neuromorphic computing devices -- Chapter 14: Perovskite multiferroic materials for sensors and transducers applications -- Chapter 15: Applications of perovskite multiferroic materials in Surface Acoustic Wave devices -- Chapter 16: Perovskite multiferroic nano materials for bio-medical applications -- Chapter 17: Concluding remarks, future outlook and emerging ideas on the sustainable perovskite multiferroic materials.

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### Sommario/riassunto

This book comprehensively introduces sustainable nature of the perovskite multiferroic materials. It covers detailed information about single-phase and composite perovskite-based multiferroics, nanostructures of multiferroics and the structural aspect. It majorly focuses on the application part of the newly emerging non-toxic perovskite multiferroics, green synthesis techniques and energy harvesting applications. The applications mainly concerning with energy harvesting, spintronics, photovoltaic and photo-catalysis, sensors, gyrators, gradiometer, transducers and memory storage devices have been provided in detail. In the recent past, the multiferroic materials are the center of attention with new breakthroughs in the above applications, including quantum computing, and comprises both scientists and young researchers as inspiration as well as critical ideas to develop new work in this area. As far as the lead-free multiferroic materials are concerned, the present book includes information on eco-friendly smart materials, as these are being majorly used as sensors and actuators in nano- or micro-electromechanical systems. The magnetoelectric coupling-based nano or micro-electromechanical devices are established to exhibit high-quality factor and can be combined with radio frequency integrated circuits. This book offers thorough exploration of green, non-toxic and viable commercial technology on multiferroic and magnetoelectric materials. The simulations based on the multiferroic materials, quantum criticality and emergent ideas of quantum electromagnets are also the center of attention of this book. In conclusion, this book is the perfect need of the materials scientists and should receive a place in the libraries of solid-state physicists and chemists who are looking to understand multiferroics from basics to latest applications. All the researchers working in the area of energy harvesting, spintronics, photovoltaic and photo-catalysis, sensors, gyrators, gradiometer, transducers, memory storage devices and quantum computing will benefit from this book. .

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