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Titolo	Functional Nanostructures and Metamaterials for Superconducting Spintronics : From Superconducting Qubits to Self-Organized Nanostructures // edited by Anatolie Sidorenko
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Descrizione fisica	1 online resource (XVII, 270 p. 148 illus., 111 illus. in color.)
Collana	NanoScience and Technology, , 1434-4904
Disciplina	620.5
Soggetti	Nanoscale science Nanoscience Nanostructures Nanotechnology Superconductivity Superconductors Microwaves Optical engineering Nanoscale Science and Technology Nanotechnology and Microengineering Strongly Correlated Systems, Superconductivity Microwaves, RF and Optical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Basic Superconducting Spin Valves -- Superconducting Triplet Proximity and Josephson Spin Valves -- Compact Josephson - Junctions -- Magnetic Proximity Effect and Superconducting Triplet Correlations at the Heterostructure of Cuprate Superconductor and Oxide Spin Valve -- Nanodevices with Normal Metal – Insulator – Superconductor Tunnel Junctions.
Sommario/riassunto	This book demonstrates how the new phenomena in the nanometer scale serve as the basis for the invention and development of novel nanoelectronic devices and how they are used for engineering

nanostructures and metamaterials with unusual properties. It discusses topics such as superconducting spin-valve effect and thermal spin transport, which are important for developing spintronics; fabrication of nanostructures from antagonistic materials like ferromagnets and superconductors, which lead to a novel non-conventional FFLO-superconducting state; calculations of functional nanostructures with an exotic triplet superconductivity, which are the basis for novel nanoelectronic devices, such as superconducting spin valve, thin-film superconducting quantum interference devices (SQUIDs) and memory-elements (MRAM). Starting with theoretical chapters about triplet superconductivity, the book then introduces new ideas and approaches in the fundamentals of superconducting electronics. It presents various quantum devices based on the new theoretical approaches, demonstrating the enormous potential of the electronics of 21st century - spintronics. The book is useful for a broad audience, including researchers, engineers, PhD graduates, students and others wanting to gain insights into the frontiers of nanoscience.

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