

Preface

Nanotechnology – a rapidly developing modern area of science & technology, covered many areas of physics, chemistry, materials science, and biology over the last decade. The unique properties of materials at the nanometer scale and the outstanding performance of the nanoscale devices are the main reasons for the immense growth of this field. Nanotechnological findings serve as the base for enormous developments of electronics and many new branches, such as spintronics and single-electron devices, new approaches for medical treatment and diagnostic procedures, the implementation of high-tech sensors and actuators. Moreover, nanotechnology does not only offer novel products but also initiates new areas, such as photonics and metamaterials. Of course, in one book, it is practically impossible to present a comprehensive overview of all areas of nanotechnology. The main goal of the present book is to show an intrinsic correlation and mutual influence of three important parts of nanoscience: new phenomena – nanomaterials – nanodevices. For the discovery of new phenomena, it is necessary to develop novel nanotechnological processes for the fabrication of nanomaterials. The nanostructures and new phenomena serve as the base for the development of novel nanoelectronic devices.

According to this concept, we organized the book into 5 parts –

Coherent Effects in Nanostructures

Nanomaterials and Nanoparticles

Nanoelectronics

Nanobiology

Philosophical Aspects of Nanoscience

presenting thoroughly selected articles reported at the International Symposium “*Nanoscale Phenomena – Fundamentals and Applications*” (Chisinau, September 19-22, 2007). The symposium brought together leading experts – experimentalists, theorists, and engineers – working in nanoscience and nanotechnology with the aim to share their expertise and experience on how the new fundamental ideas and principles can be rapidly implemented in the areas mentioned above.

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