| | | |
|---|---|---|
| 1. | Record Nr. | UNINA9910823617403321 |
| | Autore | Schommers Wolfram |
| | Titolo | Nanodesign : some basic questions / / Wolfram Schommers, Karlsruhe Institut fur Technologie (KIT), Germany |
| | Pubbl/distr/stampa | New Jersey : , : World Scientific, , [2014] <br> 2014 |
| | ISBN | 981-4520-35-7 |
| | Descrizione fisica | 1 online resource (xv, 183 pages) : illustrations (some color) |
| | Collana | Gale eBooks |
| | Disciplina | 620.5 |
| | Soggetti | Nanotechnology |
| | Lingua di pubblicazione | Inglese |
| | Formato | Materiale a stampa |
| | Livello bibliografico | Monografia |
| | Note generali | Description based upon print version of record. |
| | Nota di bibliografia | Includes bibliographical references and index. |
| | Nota di contenuto | Preface; CONTENTS; Chapter One: Nanodesign: Description at the Ultimate Level; 1.1 Treatment on the Same Footing; 1.2 Complexity of Nanosystems; 1.3 Nanotechnological Changes; 1.4 Brain Functions; 1.4.1 World Views; 1.4.2 Godel's Theorem; 1.5 The Relevance of Basic Quantum Theory to Nanotechnology; 1.5.1 Temperature Effects; 1.5.2 Quantum Devices; 1.6 Summary; Chapter Two: Principal Remarks; 2.1 Simple Nanoclusters; 2.1.1 Bifurcation Phenomena; Discussion of Fig. 5; 2.1.2 Analogies with Biological Systems; Does there exist creativity at the nanolevel? <br> 2.1.3 What is the Reason for Nanoeffects? A Few RemarksThe behavior of surface particles; Description of anharmonicities; Effects due to the anharmonicities; 2.1.4 Interaction Potential for Al; 2.1.5 Temperature Effects; 2.1.6 Methods of Description; Properties as a function of the particle number; New situation; 2.1.7 Concluding Remark and Summary; 2.1.8 What is Important?; 2.1.9 Solving the Equation of Motion; On the application of simplifying models; Basic information; 2.1.10 On the Design of Specific Nanosystems; Ferroelectric nanodevices; Design of specific materials <br> Low density lipoproteinBiomolecular nanomotors; Avidin-biotin technology; Biomolecular translocations; Hierarchical nanostructures; Nanoparticles as vectors in gene delivery; Mechanical properties of nanostructures; Conclusion; 2.1.11 Theoretical and Computational Methods; General remarks; The most important techniques; 2.1.12 |

Features of the Methods; Molecular dynamics; Nonequilibrium molecular dynamics; Quantum molecular dynamics; The Monte Carlo method; Multiscale modeling; Multiscale modeling: a typical example; 2.2 Food Chemistry: What is a Nanopizza?; 2.3 Medicine;  Brain Research
On the Impact of Nanotechnology2.3.1 Brain Research; Self-organizing process; 2.3.2 Levels of Reality; On the description of brain functions; Living systems described mathematically; Application of Godel's Theorem; Summary; 2.3.3 What Kind of Reality Do We Observe?; Experiments with animals; Respectively correct, but not comparable with each other; Nanotechnological changes of the brain functions; 2.3.4 The Strategy of Nature; An important principle: "as little outside world as possible"; Some principle remarks on biological evolution
Not cognition but the differentiation between "favorable to survival" and "hostile to survival"Nanotechnological manipulations; Summary; Lashley and Pribham; Von Foerster; The world we experience is an invention of the brain; 2.3.5 Scientific Realism; The naive point of view; The role of the equations of motion; Conclusion; Consequences for physics; 2.3.6 Kant's Philosophy; 2.3.7 Experiments with Distorting Glasses; 2.3.8 D'Arcy Wentworth Thompson; Fish; Application to nanoscience; 2.3.9 Compatibility: Some Principal Remarks; The solution of specific problems; Species-preserving principles
Petrol in an electric car?

| Sommario/riassunto | There is no doubt that nanoscience will be the dominant direction for technology in this century, and that this science will influence our lives to a large extent as well as open completely new perspectives on all scientific and technological disciplines. To be able to produce optimal nanosystems with tailor-made properties, it is necessary to analyze and construct such systems in advance by adequate theoretical and computational methods. Since we work in nanoscience and nanotechnology at the ultimate level, we have to apply the basic laws of physics. What methods and tools are relevant here"" |