New books on physics and related sciences

Gusev A A *Nanomaterials, Nanostructures, and Nanotechnologies* (Moscow: Fizmatlit, 2005) 416 pp. 138 figures. Bibliography: 1173 references.

This monograph addresses problems concerning condensed matter nanostates. It summarizes extensive experimental and theoretical material on the synthesis of nanocrystalline powders, fabrication of compact nanomaterials, small particle size determination, properties of individual nanoparticles and nanopowders, microstructure of compact nanomaterials, and grain size and interface effects on the properties of compact nanomaterials. Model approaches to the structure peculiarities and anomalous properties of materials in the nanocrystalline state are analyzed. Modern technologies and their potentials and prospects are given special attention. By presenting a consistent discussion of the structure and properties of individual nanoparticles and compact nanocrystalline materials, the book provides a unified picture of the state-of-the-art research on this specific state of matter. The monograph is rich in factual content and is in fact a concise compendium of key information on the nanocrystalline state of condensed matter. The book draws on original research over the period from 1828 to 2005, inclusive. Of the references cited in the book, more than 80% are to work done after 1988. An appreciative audience: specialists in materials science, condensed matter physics, and solid state chemistry. Ordering address: Institute of Solid State Chemistry, RAS Ural Branch, 620219 Ekaterinburg, GSP-145, ul. Pervomaiskaya 91; Gusev A A; tel. (7-343) 374-73-06, (7-343) 349-35-23; e-mail: gusev@ihim.uran.ru)

Gridchin V A, Dragunov V P, Neizvestnyi I G *Fundamentals of Nanoelectronics* A textbook. 2nd ed., revised and enlarged (Novosibirsk: Izd-vo NGTU, 2004) 496 pp. ISBN 5-7782-0387-X.

This book covers the basic physics of systems of reduced dimension and discusses the energy spectrum and transport properties of particles in multilayer structures with sharp interlayer boundaries. While intended for undergraduates, masters, and postgraduate students specializing in semiconductor and semiconductor device physics, the book is also recommended to all those who wish to systematize their thorough knowledge of nanoelectronics' physical backgrounds. (Novosibirsk State Technical University Publishing – Printing Complex: 630092 Novosibirsk, prosp. K. Marksa 20; tel./fax (7-3832) 46-31-87; e-mail: office@publish.nstu.ru; URL: http://www.publish.nstu.ru/)

Gridchin V A, Dragunov V P *Physics of Microsystems* A textbook. In two parts: Pt. 1 (Novosibirsk: Izd-vo NGTU, 2004) 416 pp. ISBN 5-7782-0446-9.

The book focuses on the physical principles of microsystems — a new line of inquiry into modern technology, which has been booming over the past two decades. This volume is concerned primarily with pressure sensors and electrostatic actuators, thus reflecting the wide range of their practical applications. The book is oriented to those engaged in the development of microsystem technologies and therefore looking for quantitative descriptions and effective numerical models. It will be a useful textbook for senior undergraduates in the disciplines of microelectronics and solid state electronics, and microsystems engineering, as well as for postgraduate students, practising engineers, and research workers. (Novosibirsk State Technical University Publishing – Printing Complex: 630092 Novosibirsk, prosp. K. Marksa 20; tel./fax (7-3832) 46-31-87; e-mail: office@publish.nstu.ru; URL: http://www.publish.nstu.ru/)

Il'yashenko Yu S *Attractors and Their Fractal Dimension* (Moscow: Izd-vo MTsNMO, 2005) 16 pp. ISBN 5-94057-201-4.

Derived from a lecture the author delivered at the *Summer School 'Modern Mathematics'* held in Dubna, Moscow region in July 2004, this brochure deals with a branch of the theory of dynamical systems, namely, with the theory of attractors and their Hausdorff (fractal) dimension. Numerous examples of mappings that generate both strange and classical attractors are discussed with a particular emphasis on the Smale – Williams solenoid, for which an analogy with Cantor discontinuum is drawn. No background knowledge in the theory of differential equations is required. This brochure is addressed to senior pupils and junior undergraduate students. (Publishing House of the Moscow Center for Continuous Mathematical Education: 121002 Moscow, Bol'shoi Vlas'evskii per. 11; tel. (7-495) 241-72-85; fax (7-495) 291-65-01; e-mail: biblio@mccme.ru; URL: http://www.mccme.ru/)

Smol'yakov E R *Theory of Conflict Equilibria* (Moscow: Editorial URSS, 2005) 304 pp. ISBN 5-354-00596-5.

The monograph brought to a readers' notice makes an introduction to the theory of conflict equilibria — an entirely new scientific discipline which, given that all our world embodies a continuous chain of conflicts, will in time find natural applications in economics, politics, art and culture, science and technology, and indeed in any areas of human activities. The most obvious areas of application are in game problems, for which a theory of cooperative, noncooperative, and antagonistic games has been built, based on a unified system of equilibria and including classical game theory as a special case; in politics and economics, where it provides a behavior selection strategy for achieving a desired end result and finding the most stable and universally suitable equilibrium state, and even in physics, where it provides a tool with which stable states of physical vacuum can be found. The book will serve as an invaluable source of information for

specialists in conflict, game, optimization, and decision making theories, and to those active in theoretical physics and mechanics. (Editorial URSS Publ.: 117312 Moscow, prosp. 60-letiya Oktyabrya 9, office 203 at the RAS Institute for Systems Analysis; tel./fax (7-495) 135-44-23, 135-42-16; e-mail: urss@urss.ru; URL: http://www.urss.ru/)

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