

New books on physics and related sciences

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Feinberg E L *Epoch and Personality. Physicists. Essays and Memories* 2nd ed. revised and enlarged (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2003) 416 pp. ISBN 5-94052-068-2.

This is a collection partly of essays on, partly of recollections of, some of the prominent Russian physicists with whom the author had more or less close relations for the space of decades. Also included are recollections of N Bohr and an essay on W Heisenberg. Although nearly all the essays have already been published, new times and declassified archives allowed significant additions to be made. It happened involuntarily that the title of the book proved to be the common theme of all the essays. It is intended for a wide range of readers interested in what the life of scientists was like in the totalitarianism-plagued 20th century. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskiĭ prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

Physics of Crystallization: G G Lemmlein Centenary Collection of articles (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2002) 400 pp. ISBN 5-94052-063-4.

The original and review papers in this collection present the state of the art in crystal morphology, elementary growth processes, growth process modeling, and current methods for surface and thin-film studies. The papers are written by leading specialists in their chosen fields. Also included are recollections of G G Lemmlein's colleagues and students, which give a vivid picture of his personality and of the state of science in the first half of the 20th century. Aimed at research workers and practising engineers involved and interested in what is happening in the field of crystal growth, the book will also be of value to a broad spectrum of solid-state physicists. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskiĭ prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

Chuprunov E V, Khokhlov A F, Faddeev M A *Fundamentals of Crystallography* (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2004) 496 pp. ISBN 5-94052-060-1.

This book provides a systematic presentation of the fundamentals of geometric crystallography, including the analytical geometry of crystal lattices, the theory of point symmetry groups, regular point systems, faces and other symmetric objects, Bravais lattices, spatial symmetry groups, and theory of closest-packed arrangement. The fundamentals of crystallochemistry and basics of the geometric theory of crystal

defects are covered as well. It is suitable for students in the discipline of crystallography in physics and chemistry departments at universities and other higher education institutions. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskiĭ prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

Problems in Crystallography (Ed. by E V Chuprunov, A F Khokhlov) (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2003) 208 pp. ISBN 5-94052-066-3.

Problems from the major branches of crystallography are presented. Each section starts with a detailed analysis of several typical problems containing additional information necessary for independent solving subsequent unworked problems. Because many problems are given in several versions, it proves possible to individualize assignments for each individual student. Most problems are original and reflect the authors' experience in teaching crystallography to physics students at Nizhniĭ Novgorod University. Some of the sections — for example, those on the operator method for describing symmetry operations or those on noncrystallographic symmetry and some others — are even presented for the first time in the form of problems and exercises. The book is designed for students in the discipline of crystallography in physics and chemistry departments at universities and other higher education institutions. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskiĭ prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

Ryazanov M I *Introductory Electrodynamics of Condensed Matter* (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2002) 320 pp. ISBN 5-94052-060-X.

The book covers the macroscopic electrodynamics of condensed media, including the theory of propagation of electromagnetic waves in amorphous and crystal dielectrics, local field theory, and the electrodynamics of semiconductors. The theory of superconductivity is presented based on the phenomenological Ginzburg–Landau theory. Coverage also includes the dynamic theory of X-ray diffraction, as well as the bremsstrahlung and transition radiation from fast charged particles traveling in matter. The book can be useful to specialists who encounter problems in the electrodynamics of condensed matter in their work, as well as to senior undergraduate students and postgraduate students. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskiĭ prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

Computers and Supercomputers in Biology (Ed. by V D Lakhno and M N Ustinin) (Moscow – Izhevsk: Institute for Computer

Studies, 2002) 528 pp. ISBN 5-93972-188-5 (a CD is provided with the book).

This book focuses on the applications of computers and supercomputers in molecular biology, biophysics, ecology, and medicine. The authors' panel is made up of researchers with unique experience in applying supercomputers to computational problems in biophysics. The material is presented in two parts: 'The structure and physical properties of DNA and proteins, charge transfer in DNA, photosynthesis reaction center' (Part 1), and 'Bioinformatics, computer ecology and medicine' (Part 2). Offering a uniquely broad coverage of problems and written in a rigorous style, the book will help specialists from other areas of exact science as well as postgraduate and senior undergraduate students in natural sciences join in the solution of the topical problems of modern biology. (Institute for Computer Studies: 426034 Izhevsk, ul. Universitetskaya 1; tel./fax: (7-3412) 500-295; e-mail: borisov@rcd.ru; URL: <http://ics.org.ru/>)

Sazhin M V *Modern Cosmology Made Simple* (Moscow: Editorial URSS, 2002) 240 pp.

The basic ideas and facts about cosmology are presented in a popular form in this book. The critical observational tests of cosmology are discussed, and all cosmological epochs are characterized, each of which is an important landmark in the existence of our world. Special attention is given to observational and physical cosmology and to those areas of cosmology that are appealing from an epistemological point of view. (Editorial URSS Publ.: 117312 Moscow, prosp. 60-letiya Oktyabrya 9, office 203 at the RAS Institute for Systems Analysis; tel./fax (7-095) 135-44-23, 135-42-46; e-mail: urss@urss.ru; URL: <http://urss.ru/>)

Skubov D Yu, Khodzhaev K Sh *Nonlinear Electromechanics* (Moscow: Fizmatlit, 2003) 360 pp. ISBN 5-9221-0298-2.

Original results on the dynamics of nonlinear electromechanical systems, obtained by the authors and their colleagues from the 'Mechanics and Control Processes' Department at St.-Petersburg State Technical University, are utilized and developed. The major emphasis is given to solving general problems concerning the determination of equilibrium state; the calculation of periodic and other types of motion in various classes of electromechanical systems, and the stability analysis of such motions using the asymptotic and qualitative methods of nonlinear mechanics. Quite substantial coverage is given to the development of the general theory of synchronous electric machines and electromagnetic vibration generators, whose technical characteristics have provided almost exhaustive insight into the nature of motions in these systems. (Fiziko-Matematicheskaya Literatura & MAIK Nauka/Interperiodika Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel./fax (7-095) 334-74-21, 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fizmatlit.ru/>)

Tsirlin A M *Optimization Methods in Irreversible Thermodynamics and Microeconomics* (Moscow: Fizmatlit, 2003) 416 pp. ISBN 5-9221-0265-6.

Optimization and optimal control methods are invoked for examining the performance limits of thermal, chemical, and mass exchange processes at a fixed average target flow rate. The analogy between thermodynamic and microeconomic systems allows the transfer of the methodology of finite-time thermodynamics to microeconomics by quantifying process irreversibility and, in particular, by introducing an economic analogue of dissipation. The book examines the class of minimal dissipation processes, for which the range of accessible regimes is determined through thermodynamic and microeconomic balance equations. The book is intended mainly for research workers, postgraduates, and undergraduates interested in optimization methods and their thermodynamic and economic applications. (Fiziko-Matematicheskaya Literatura & MAIK Nauka/Interperiodika Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel./fax (7-095) 334-74-21, 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fizmatlit.ru/>)

Antipov B L, Sorokin V S, Terekhov V A *Electronic Engineering Materials: Problems and Questions* 3rd ed. (St.-Petersburg: Lan', 2003) 208 pp. ISBN 5-8114-0410-7.

The book contains questions and problems whose solution should help readers to solidify and deepen their understanding of physical processes and phenomena in conductor, semiconductor, dielectric, and magnetic materials, and to acquire practical skills for effectively using materials in developing electronic instruments and devices for various assignments. Solutions are given for typical and high-complexity problems, and all personal study problems are provided with answers. The questions and problems presented in the book can be used in practical sessions and colloquia, for controlling students' self-tuition, as individual homework assignments, and in the preparation for examinations and credit tests. (Lan' Publ.: 193029 St.-Petersburg, ul. Krupskoi 13; tel. (7-812) 567-85-78, (7-812) 567-14-45; tel./fax (7-812) 567-54-93; e-mail: root@lanpbl.spb.ru; URL: <http://www.lanpbl.spb.ru/>)

Vladimirov V S, Zharinov V V *Equations of Mathematical Physics* (Moscow: Fizmatlit, 2003) 400 pp. ISBN 5-9221-0310-5.

The textbook is an abridged and simplified version of V S Vladimirov's course *Equations of Mathematical Physics* (5th ed., Moscow: Nauka, 1985). The author taught the course to students at Moscow Physical-Technical Institute for many years (1964–1986). The main feature of the book is the wide use of the concept of the generalized solution to the boundary value problems of classical mathematical physics — an approach which often makes it possible to give a rigorous mathematical meaning to formal calculations. The theory of and operations with generalized functions is given a chapter in this text. The book will be of interest to students at higher education institutions with an advanced mathematics curricula. (Fiziko-Matematicheskaya Literatura & MAIK Nauka/Interperiodika Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel./fax (7-095) 334-74-21, 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fizmatlit.ru/>)

Budak B M, Samarskiĭ A A, Tikhonov A N *A Problem Book in Mathematical Physics* 4th ed. revised (Moscow: Fizmatlit, 2003) 688 pp. ISBN 5-9221-0311-3.

This collection contains problems associated with the derivation of equations and boundary conditions, as well as with the application of various methods available for the solution of the basic boundary value problems of mathematical physics. Solution hints are provided for each problem along with an answer, and for many problems solutions illustrating the use of major methods are presented. The book is intended for university students. (Fiziko-Matematicheskaya Literatura & MAIK Nauka/ Interperiodika Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel./fax (7-095) 334-74-21, 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fizmatlit.ru/>)

Mark Aronovich Aizerman (1913–1992) (Moscow: Izd. Fiziko-Matematicheskoi Literatury, 2003) 318 pp. ISBN 5-94052-067-7.

The recollections of M A Aizerman and his role in science were specially prepared for this edition by prominent scientists — his friends, colleagues, and students. Mark Aronovich's lifelong interests were the automobile engine tuning theory, the theory of tank rotation mechanisms, automatic control theory, finite automata theory, pattern recognition theory, pneumatics and neumonics, bionics, the theory of choice, and other fields of engineering. Numerous documents and a complete bibliography of Aizerman's works are included in this book intended for practising specialists and undergraduate and postgraduate students interested in the history of science. (Fiziko-Matematicheskaya Literatura Publ.: 119071 Moscow, Leninskii prosp. 15; tel.: (7-095) 952-49-25; fax: (7-095) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: <http://www.fizmatlit.narod.ru/>)

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