

## New books on physics and related sciences

DOI: 10.3367/UFNe.0185.201505o.0559

**Yakov Borisovich Zel'dovich: Reminiscences, Letters, Documents** (Eds S S Gershtein, R A Sunyaev) 3rd edition, stereotype (Moscow: Izd-vo Fizmatlit, 2014) 416 pp. ISBN 978-5-9221-1532-2.

Ya B Zel'dovich, an outstanding scientist of the 20th century, made great contributions to many fields of science and technology. He was unique in the scope of his interests — from physics of combustion and explosion, through nuclear weapons, up to the very depths of astrophysics and cosmology. Before making Zel'dovich's acquaintance, the prominent English physicist Stephen Hawking believed that Zel'dovich was the penname of a researcher team (like Bourbaki), so great was the number of results obtained by him. Lev Landau said that he knew not a single physicist, except Enrico Fermi, who had such a wealth of ideas as Zel'dovich. The book contains reminiscences of his friends, colleagues, and disciples, in particular, of many famous scientists, and also some archival documents and letters. The book is intended for a wide range of readers interested in the history of the development of science and the history of the Soviet Atomic project. (Fizmatlit Publishers: 117342 Moscow, ul. Butlerova 17B; tel. +7 (499) 968-92-28; e-mail: fizmat@maik.ru; URL: <http://www.fml.ru/>)

**Zel'dovich Ya B, Myshkis A D Elements of Mathematical Physics: Medium of Noninteracting Particles (Physical Essence of Mathematical Physics Methods)** 2nd edition (Moscow: Izd-vo URSS, 2014) 360 pp. ISBN 978-5-9710-1088-3.

This book is an independent part of the course in mathematical physics, related to the book *Elements of Applied Mathematics* by the same authors. Its main specific features are the concentration of the presentation on physical problems, the derivation of mathematical methods from the physical core of the problem, a comprehensive retracing of analogies between mathematics and physics, and the presence of physical meaning in mathematical solutions. Special attention is paid to the kinetic equation, the diffusion equation, conservation laws, and discontinuities. The book is mostly meant for students in physics and other specialties for whom a physics course is decisively important, and also for all those who wish to get acquainted with the physical essence of mathematical physics methods (URSS Publishers: Nakhimovskii prospect 56, 117335 Moscow, Russian Federation; tel./fax: +7 (499) 724-25-45; e-mail: [urss@URSS.ru](mailto:urss@URSS.ru); URL: <http://urss.ru/>)

**Feynman R Radost' Poznaniya** (Russian translation by T A Lomonosova (Moscow: Izd-vo AST, 2014), 266 pp. ISBN 978-5-17-078430-1.

Original: **Feynman R The Pleasure of Finding Things Out** (Cambridge, Mass.: Perseus Books, 1999)

This marvelous collection of short articles written by a glorious scientist, a talented pedagogue, a brilliant orator, and simply an interesting person, Richard Feynman, consists of startling, witty interviews and speeches, lectures, and articles. The articles included in the collection not only show the reader the encyclopedic intellect of the celebrated physicist, but also provide insight into his everyday life and his inner world. This is a book of opinions and ideas concerning the prospects of science, the responsibility of scientists to the fate of the world, and the main problems of being. It is cognitive, penetrative, humorous, and exceedingly interesting. (AST Publishers: Zvezdnyi bulvar 21, korpus 3, flat 5, 129085 Moscow, RF; tel. +7(495) 268-08-42; URL: <http://shop.ast.ru/>)

**Kotel'nikov V A Collected Works Vol. 4. Fundamentals of Radio Engineering Part 1** (Compiled by A S Prokhorov) (Moscow: Izd-vo Fizmatlit, 2013) 368 pp. ISBN 978-5-9221-1567-4.

**Kotel'nikov V A Collected Works Vol. 5. Fundamentals of Radio Engineering Part 2** (Compiled by A S Prokhorov) (Moscow: Izd-vo Fizmatlit, 2014) 312 pp. ISBN 978-5-9221-1601-5.

The collected works of the outstanding Russian scientist and engineer V A Kotel'nikov were prepared in honor of celebrating the centenary of his birthday. The fourth volume contains Part 1, and the fifth volume Part 2 of the classical two-volume textbook, *Fundamentals of Radio Engineering*, which he wrote together with A M Nikolaev on the basis of the lecture course of the same name which V A Kotel'nikov delivered at the Moscow -Power Engineering Institute (MPEI) in the 1940s and 1950s. The first part (linear radio engineering), published in 1950, and the 2nd part (nonlinear radio engineering), published in 1954, were an encyclopedia of engineering technical and theoretical knowledge of radio engineering of the day. This was a manual for many generations of students at MPEI and other institutes in both the USSR and China (two volumes were issued there in the Chinese language). The unique structure of this two-volume textbook and the method of material presentation also make it interesting for today's generation of students, postgraduates, teachers, and practising engineers, and for all those interested in the history of the development of science and technology in our country. (Fizmatlit Publishers: 117342 Moscow, ul. Butlerova 17B; tel. +7 (499) 968-92-28; e-mail: [fizmat@maik.ru](mailto:fizmat@maik.ru); URL: <http://www.fml.ru/>)

**Tsytoich B N Nonlinear Effects in Plasma** 2nd edition revised and extended (Moscow: Izd-vo URSS, 2014) 296 pp. ISBN 978-5-9710-0861-3.

This book is devoted to the study of nonlinear effects in plasma, the account of which is necessary for understanding

the most important physical processes in plasma. The exposition is based on the notions of the induced processes employed in the physics of quantum generators and therefore known to a wide range of scientists. The physical premises underlying the dynamic description borrowed from nonlinear optics and the statistical description of nonlinear interactions are discussed. A large number of various applications of nonlinear effects are described that concern many problems—from the origin of cosmic rays and the physics of cosmic plasma to plasma heating and the efficiency of beam–plasma interactions, etc. The book is recommended to a wide circle of physicists, namely, students, teachers, and research workers. (URSS Publishers: Nakhimovskii prospect 56, 117335 Moscow, Russian Federation; tel./fax: +7 (499) 724-25-45; e-mail: [urss@URSS.ru](mailto:urss@URSS.ru); URL: <http://urss.ru/>)

**Khomich V Yu, Yamshchikov V A** *Basic Principles of the Design of Systems for Electric Discharge Excitation of High-Power CO<sub>2</sub>, N<sub>2</sub>, and F<sub>2</sub> Lasers* (Moscow: Izd-vo Fizmatlit, 2014) 164 pp. ISBN 978-5-9221-1583-4.

This monograph is concerned with the elaboration and study of systems for electric discharge excitation of high-power CO<sub>2</sub>, N<sub>2</sub>, and F<sub>2</sub> lasers. The excitation system is considered as an electrophysical unit consisting of a battery of excitation devices operating on the basis of a volume self-sustained discharge. The mechanisms and regularities of electrophysical phenomena in a self-sustained discharge in gas laser media are described. The results of excitation-system operation optimization are presented and examples are given of the creation on their basis of effective CO<sub>2</sub>, N<sub>2</sub>, and F<sub>2</sub> lasers generating in the radiation range from infrared to vacuum ultraviolet. The book is intended for specialists in laser physics and gas-discharge processes, designers, teachers, postgraduates, and students in physics and physico-technical specialties. (Fizmatlit Publishers: 117342 Moscow, ul. Butlerova 17B; tel. +7 (499) 968-92-28; e-mail: [fizmat@maik.ru](mailto:fizmat@maik.ru); URL: <http://www.fml.ru/>)

**Volostnikov V G** *The Methods of Analysis and Synthesis of Coherent Light Fields* (Moscow: Izd-vo Fizmatlit, 2014) 256 pp. ISBN 978-5-9221-1586-5.

This monograph considers noninterferential methods of analysis and nonholographic methods of synthesis of coherent light fields. The so-called phase problem in optics is studied in different formulations. The important role of the vortex component of the light energy flux vector is shown. The theory of structure-stable light fields rotating under propagation and focusing is presented. Their practical applications are exemplified. The book is earmarked for specialists in the field of coherent optics and for students of corresponding specialties. (Fizmatlit Publishers: 117342 Moscow, ul. Butlerova 17B; tel. +7 (499) 968-92-28; e-mail: [fizmat@maik.ru](mailto:fizmat@maik.ru); URL: <http://www.fml.ru/>)

**Lyubarskii G Ya** *Group Theory and Physics* 2nd edition (Moscow: Izd-vo URSS, 2014) 232 pp. ISBN 978-5-9710-1138-5.

This book is meant to be an introduction to group theory and the methods of its employment in applications. Along with the purely methodical task of expounding comprehensively on the problems and methods of group theory, the book solves another important problem—to outline the role of

group theory in the development of physics and to clarify its implements for use in future physical research. The necessary information from linear algebra and quantum mechanics is included. The book is meant for research workers, engineers, teachers, and students and will acquaint senior pupils with some characteristic features of modern mathematics. (URSS Publishers: Nakhimovskii prospect 56, 117335, Moscow, Russian Federation; tel./fax: +7 (499) 724-25-45; e-mail: [urss@URSS.ru](mailto:urss@URSS.ru); URL: <http://urss.ru/>)

**Lyubarskii G Ya** *Group Theory and Its Application in Physics: Lecture Course for Theoretical Physicists* 2nd edition (Moscow: Izd-vo URSS, 2014) 360 pp. ISBN 978-5-9710-1267-2.

This book systematically presents the group representation theory, analyzes the group representations playing an important role in physics, and, on this basis, considers different applications of the group representation theory in theoretical physics. The book is written for senior students of physical faculties of universities, postgraduates, and research workers. (URSS Publishers: Nakhimovskii prosp. 56, 117335 Moscow, Russian Federation; tel./fax: +7 (499) 724-25-45; e-mail: [urss@URSS.ru](mailto:urss@URSS.ru); URL: <http://urss.ru/>)

**Pavlovskii Yu N, Belotelov N V, Brodsky Yu I** *Computer Simulation* (Dolgoprudnyi: Izd-vo Fizmatkniga, 2014) 304 pp. ISBN 978-5-89155-247-0.

The questions considered in the book are associated with the creation and study of a wide class of simulation models of complex socio-economic and technical-organizational systems. The base theoretical positions of simulation are discussed and the main mathematical information necessary for constructing simulation models is presented. Modern tools for the creation of simulation models are reviewed. Several simulation models of complex systems developed by the authors at different times are described in detail. The textbook includes some studies undertaken by the authors in recent years: the chapter devoted to the synthesis of models of complex multicomponent systems, and the chapter devoted to a combination of methods of mathematical and humanitarian analysis in the investigation and simulation of complex processes. The textbook is based on lecture courses concerning various aspects of mathematical and computer simulation that the authors delivered for a number of years at Lomonosov Moscow State University, Moscow Institute of Physics and Technology, the N E Bauman Moscow State Technical University, the National Research University ‘Higher School of Economics’, Moscow State Pedagogical University, and the D I Mendeleev University of Chemical Technology of Russia. The textbook may be helpful to students of technical institutions and universities engaged in computer and mathematical simulation and to students, postgraduates, and specialists interested in the creation of simulation models of complex systems. (Fizmatkniga Publishers: ul. Akademika Lavrent’eva 8, 141700 Moscow region, Dolgoprudnyi, Russian Federation; tel. +7(495) 971-26-04; e-mail: [publishers@mail.mipt.ru](mailto:publishers@mail.mipt.ru); URL: <http://www.fizmatkniga.ru/>)

Compiled by *E V Zakharova*  
(e-mail: [zaharova@ufn.ru](mailto:zaharova@ufn.ru))