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## New books on physics and related sciences

**Fabelinskii I L** *Selected Works* In two volumes (Ed. V L Ginzburg) (Editorial Board: S V Krivokhizha, L V Vainshtein, T S Velichkina) (Moscow: Fizmatlit, 2005) Vol. 1 — 448 pp. ISBN 5-9221-0654-6; Vol. 2 — 503 pp. ISBN 5-9221-0658-9.

These two volumes are a nearly complete collection of the prominent physicist's papers and essays on the subjects such as the molecular scattering of light, molecular acoustics, and linear and nonlinear spectroscopies. The papers cover a wide array of experimental material, including newly discovered light scattering phenomena. The first volume compiles original research by Fabelinskii, while the second contains his review papers of 1957-2003 and recollections of him by his friends, his colleagues, and those he taught. The review papers present not only broad coverage of light scattering studies, by they also describe how other areas of science have benefited from scattered light spectroscopy and formulate new problems yet to be resolved. Some of the reviews are historical and cover the key discoveries in the field. The reviews are of considerable interest for researchers and undergraduate and postgraduate students, whereas from the recollections Fabelinskii's outstanding personality emerges. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: http://www.fml.ru/)

Smorodinskii Ya A Selected Works ('Classics of Science' Series, Eds Yu A Danilov, V G Kadyshevskii, A N Sisakyan) 2nd ed. (Moscow: Editorial URSS, 2006) 568 pp. ISBN 5-8360-0295-9.

This book contains a posthumous selection of Professor Yakov Abramovich Smorodinskii's contributions to most areas of theoretical physics, from elementary particle physics and the theory of the nucleus to cosmology and mathematical physics. The last chapter includes reminiscences by his friends and colleagues. The contents by chapter are as follows: 'Starting the road', 'Nucleon – nucleon interactions, polarization, the complete experiment', 'Symmetry in physics', 'The three-body problem', 'Weak interactions and neutrino physics', 'Last papers (quantum algebras)', 'Works devoted to Ya A Smorodinskii', 'Recollections', and 'Bibliography'. (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/)

*The Seminar: V L Ginzburg's 90th Birthday Collection of Papers and Talks* (Compiled by B M Bolotovskii, Yu M Bruk) (Moscow: Izdatel'stvo Fiziko-Matematicheskoi Literatury, 2006) 264 pp. ISBN 5-94052-126-6.

*Uspekhi Fizicheskikh Nauk* **176** (11) 1247–1248 (2006) Translated by E G Strel'chenko DOI: 10.1070/PU2006v049n11ABEH006258

This book includes some material from the jubilee sessions of the All-Moscow Seminar on Theoretical Physics that lasted from 1956 to 2001 under the direction of V L Ginzburg at P N Lebedev Physics Institute, RAS. The book contains two Ginzburg's preprints dedicated to the seminar and published here for the first time, and also features recollections and stories by physicists who attended the seminar for many years and who, judging from the humor and jokes they display, have not after all lost their optimism and ability to smile. A 90th birthday dedication to Vitalii Lazarevich Ginzburg, the book is of interest to physicists in a variety of fields, to faculty, undergraduate, and postgraduate students in physics at higher educational institutions, to science historians, and to all those interested in what Russian science has been and will be. (Physics and Mathematics Literature Publ.: 119071 Moscow, Leninskii prosp. 15; tel. (7-495) 952-49-25, fax (7-495) 955-03-30; e-mail: fizmatlit@mtu-net.ru; URL: http://www.fizmatlit.narod.ru/)

**Ochkin V N** Spectroscopy of Low-Temperature Plasma (Moscow: Fizmatlit, 2006) 472 pp. ISBN 5-9221-0701-1.

The current status of and prospects for classic and laser spectroscopies as a tool for low-temperature plasma studies are examined. The results of the application of light emission, absorption, refraction and scattering techniques to a thermally nonequilibrium plasma are discussed in terms of physical interpretation and how they relate to the microscopic and macroscopic parameters of the plasmas. Considerable attention is given to plasma research based on the electronic and vibration-rotation spectra of simple molecules in the absence of equilibrium between various degrees of freedom. Methods for determining the chemical composition, energy balance, partial temperatures of the neutral and charged components, as well as electric and magnetic fields in the plasma are discussed. As a predominantly practically oriented guide, the book provides useful reference data for experimentalists, including atomic and molecular constants along with the molecular emission spectra of plasmas. The book is intended for experimental specialists in the physics and chemistry of gas lasers and low-temperature plasma, as well as for senior undergraduates and postgraduate students in physics-related disciplines. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: http://www. fml.ru/)

**Toptygin I N** *Modern Electrodynamics* Vol. 2 *Theory of Electromagnetic Phenomena in Matter* (Moscow–Izhevsk: IKI, 2005) 848 pp. ISBN 5-93972-493-0.

The structure of the second part of this book remains generally unchanged from the first part published earlier in 2003 (Batygin V V, Toptygin I N *Modern Electrodynamics* Vol. 1 *Microscopic Theory* (Izhevsk: RKhD, 2003) 736 pp. ISBN 5-93972-164-8). The book combines the style of a concise textbook with that of a problem book with answers and partially worked solutions. Overall, about 750 problems and exercises are contained in the second part. Along with electrodynamic problems proper, the book pays a good deal of attention to electrodynamic applications in related fields, including the thermodynamic and statistical theory of dielectric, superconducting, and magnetic materials; the quantum theory of atoms and solids; magnetic hydrodynamics; theory of vibrations and waves in various media; nonlinear waves; theory of particle acceleration in turbulent plasma media, and so forth. In this connection, there is extensive material in the book both on the problems in electrodynamics proper and on the laws and methods of quantum mechanics, thermodynamics, statistical physics, and physical kinetics. The book is designed for preparing specialists in physics and engineering, and it is also a valuable reference source for researchers, practising engineers, and faculty in various physics-related disciplines. (Institute for Computer Studies: 426034 Izhevsk, ul. Universitetskaya 1; tel./fax (7-3412) 50-02-95; e-mail: borisov@ics.org.ru; URL: http://www.ics.org.ru/)

## Kravchenko V F Electrodynamics of Superconducting Structures: Theory, Algorithms, and Computation Methods (Moscow: Fizmatlit, 2006) 280 pp. ISBN 5-9221-0704-6.

This monograph presents and summarizes theoretical results available on the surface impedance of superconductors. It examines various impedance boundary conditions and evaluates their respective applicability to electrodynamic boundary problems. It investigates a large number of superconducting structure models for inner and outer boundaryvalue problems. New algorithms are obtained and methods for computing them are developed. Some of the results considered were presented in a lecture course for senior students in the Department of Radio Physics and Solid State Electronics at the Moscow Institute of Physics and Technology, core department of the Institute of Radioengineering and Electronics, RAS. Target audience comprises research workers; engineers involved in the fields of radio physics and electronics and in modeling physical processes occurring in various superconducting media, as well as undergraduate and postgraduate students specializing in applied physics and computational mathematics. A suitable textbook for undergraduate majors in Applied Mathematics and Physics, according to the recommendation by the Russian Federation Academic Methodology Center for classical university education. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@ maik.ru; URL: http://www.fml.ru/)

## **Zheltikov A M** Ultrashort Pulses and Methods of Nonlinear Optics (Moscow: Fizmatlit, 2006) 296 pp. ISBN 5-9221-0693-7.

Ultrashort pulses of electromagnetic radiation from laser sources are an interesting physical object and a unique tool for studying fast processes in physics, chemistry, and biology. Femtosecond laser pulses allowed the first real-time observations of the dynamics of fast elementary molecular processes and provided instantaneous pictures of molecules and atomic groups at various stages of a chemical reaction. Probing the dynamics of inneratomic electrons, however, requires pulses of less than a femtosecond duration — so-called attosecond pulses. The generation of such pulses was only made possible in the beginning of the 21st century through the use of nonlinear optical interactions between high-intensity ultrashort laser pulses. It is how spectacular advances in the generation and amplification of ultrashort pulses shape the development of nonlinear optics and spectroscopy techniques that is the subject matter of this book. The monograph is intended for professionals, researchers, practising engineers, and undergraduate and postgraduate students specializing in the fields of optics and laser physics, as well as for readers with a general physics background who are interested in the problems of nonlinear optics. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: http:// www.fml.ru/)

**Morozov A I** Introduction to Plasma Dynamics (Moscow: Fizmatlit, 2006) 576 pp. ISBN 5-9221-0681-3.

'Gas' models of classical low-density plasma are hierarchically described, in terms of which basic plasma systems and their practical implementations (equilibrium configurations, linear and shock waves, steady-state flows, plasma chemistry, and plasma lasers) are considered. A number of cosmic phenomena, including planetary vortices and terrestrial and solar magnetospheres, are also described. The book concludes with a discussion of applied plasma-dynamic systems. Senior undergraduate students, postgraduate students, engineers, and researchers working in this field are the target audience. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@ maik.ru; URL: http://www.fml.ru/)

Landsberg G S *Optics* 6th ed. (Moscow: Fizmatlit, 2006) 848 pp. ISBN 5-9221-0314-8.

Now in its 6th edition, this textbook on the fundamentals of optics is reprinted from the previous — fifth — edition of 1976, which was revised and extensively expanded by G S Landsberg's pupils and colleagues. (The previous edition, the fourth, appeared in 1957 and was the last one the author himself prepared for publication.) The book is based on the lectures delivered by the author in the Department of Physics at Moscow State University and then at the Moscow Institute of Physics and Technology. The textbook is intended for undergraduate students in physics-related disciplines. (Fizmatlit Publ.: 117997 Moscow, Profsoyuznaya ul. 90; tel. (7-495) 334-74-21, fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: http:// www.fml.ru/)

Kravchenko V F, Nesenenko G A, Pustovoit V I Poincaré Asymptotic Expansions of Solutions for Irregular Heat and Mass Transfer Problems (Moscow: Izdatel'stvo Fiziko-Matematicheskoi Literatury, 2006) 420 pp. ISBN 5-94052-115-0.

The monograph covers asymptotic expansions in the sense of Poincaré and those in the sense of Erdelyi, discusses their respective properties, and indicates the differences. It also examines the basic features of the 'geometrical-optical' asymptotic method and provides examples of how to use it to obtain Poincaré asymptotic expansions of solutions for singularly perturbed (irregular) heat and mass transfer problems with nonlinear moving boundaries. At the heart of the 'geometrical-optical' asymptotic method is the mathematically correct asymptotic analysis of the integral representations of solutions expressed in terms of the relevant Green's functions. The monograph is intended for research workers as well as for postgraduate students and senior undergraduate students in related disciplines. (Physics and Mathematics Literature Publ.: 119071 Moscow, Leninskii prosp. 15; tel. (7-495) 952-49-25, fax (7-495) 955-03-30; e-mail: fizmatlit@ mtu-net.ru; URL: http://www. 'fizmatlit.narod.ru/)

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