

New books on physics and related sciences

DOI: 10.1070/PU2008v051n09ABEH006728

Ginzburg V L, Andryushin E A *Superconductivity* (Biblioteka SOI ‘Idei i tekhnologii budushchego’) 2nd ed., revised and enlarged (Moscow: Izd. Alpha-M, 2006) 110 pp. ISBN 5-98281-088-6.

The phenomenon of superconductivity (one of the most complicated in the solid-state physics) is presented. The unusual properties of metals at low temperatures are explored, as are the examples of their usage in technology and information concerning modern discoveries in physics. (Alpha-M Publ.: 127247 Moscow, Dmitrovskoe shosse 107, office 160: tel./fax (7-495) 485-51-77; e-mail: alfa-m@inbox.ru)

Asinovskii E I, Kirillin A V, Nizovskii V L *Stabilized Electric Arcs and Their Application in Thermal Physics Experiments* 2nd ed., revised and enlarged (Moscow: Fizmatlit, 2008) 264 pp. ISBN 978-5-9221-0974-1.

This monograph deals with the study of low-temperature plasmas using stabilized electric arcs. The problems of thermodynamic equilibrium and composition calculations, as well as thermodynamical, transport, and optical properties of low-temperature plasmas are considered. The design philosophy of electric arc generators of low-temperature plasma, as well as the computing methods of arc column characteristics, are described. Low-temperature plasma diagnostic techniques were detailed. Special attention was given to the spectral methods of particle density and temperature measurements. The book is aimed at researchers inquiring into low-temperature plasma. (Fiziko-Matematicheskaya Literatura MAIK ‘Nauka/Interperiodika’ Publ.: 117997 Moscow, ul. Profsoyuznaya 90; tel. (7-495) 334-74-21; fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fml.ru/>)

Znamenskii N V *Spectra and Dynamics of Optical Transitions of Rare-Earth Ions in Crystals* (Moscow: Fizmatlit, 2008) 192 pp. ISBN 978-5-9221-0947-5.

This monograph covers the fundamental and applied aspects of rare-earth ion spectroscopy in crystal matrixes of different structures. The whole spectrum of modern knowledge and ideas concerning the physical processes proceeding in excited rare-earth ions is profoundly, and at the same time understandably, stated. The book appeals to researchers dealing with laser spectroscopy of crystals, as well as to postgraduates and students in the senior course of relevant specialties. (Fiziko-Matematicheskaya Literatura MAIK ‘Nauka/Interperiodika’ Publ.: 117997 Moscow, ul. Profsoyuznaya 90; tel.

(7-495) 334-74-21; fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fml.ru/>)

Smorodov E A, Galiakhmetov R N, Il’gamov M A *Cavitation Physics and Chemistry* (Moscow: Fizmatlit, 2008) 228 pp. ISBN 978-5-02-036626-8.

This monograph deals with the research on cavitation phenomena in liquids of different natures. Special attention is paid to high energy density production methods attained with nonlinear pulsations of cavitation bubbles. Hypotheses for the nature of high-energy physical and chemical processes proceeding under cavitation conditions are examined. The book deals with a subject that is, in many respects, disputable and not studied enough — the determination of energy storage (cumulation) limits in nonlinear gas bubble compression under the alternating external pressure and the study of the nature of corresponding physical and chemical processes. This subject has become even more urgent since reports on the possibility of the initiation of a thermonuclear reaction under these conditions appeared. In the book, different methods of acoustic and hydrodynamic cumulation of energy in circumstances where cavitation occurs are examined, and a review of scientific publications on this topic dating up to 2007, inclusive are presented. Taking into account the fact that reviews concerning this subject are numerous, the authors focused on the most recent publications which had not yet been reviewed and were in many respects disputable. Nevertheless, the authors keep at a great distance away from the so-called ‘alternative’ science, and all the effects are examined from the position of modern physics. In particular, the treatment of the cold nuclear fusion phenomenon (Chapter 4), which had become common among physicists, is aimed at showing that far from all nuclear fusion channels have been studied, and all the pieces of evidence are given on the grounds of publications in the leading physical journals. This book is intended for postgraduate students at research institutions and institutes of higher education, as well as for engineering staff and chemical technologists. (Akademizdatstentr ‘Nauka’ RAN Publ.: 117997 GSP-7 Moscow V-485, ul. Profsoyuznaya 90; tel. (7-495) 334-71-51; fax (7-495) 420-22-20; e-mail: secret@naukaran.ru; URL: <http://www.naukaran.ru/>)

Volkov K N, Emel’yanov V N *Large Vortex Modeling in Turbulent Flow Calculations* (Moscow: Fizmatlit, 2008) 368 pp. ISBN 978-5-9221-0920-8.

This book gives a systematic presentation of issues concerning the application of the method of large vortex modeling in turbulent flow calculations. The main consideration is given to the closure of Navier–Stokes filtered equations and to the construction of subgrid viscosity models. The peculiarities of numeral implementation of the method of coarse vortex modeling in turbulent flow are regarded and the results of

inner and jet turbulent flow calculations are given. Systemization and generalization of the results allowed the authors to formulate a series of problems whose solution holds much significance for advancing this line of investigation in a numerical simulation of turbulence. It was also found possible to single out the problems for which the application of the above method appeared realizable and expedient. The book will be a useful reference source for experienced practitioners in the field of fluid mechanics, as well as for postgraduate and undergraduate students of relevant specialties. (Fiziko-Matematicheskaya Literatura MAIK 'Nauka/Interperiodika' Publ.: 117997 Moscow, ul. Profsoyuznaya 90; tel. (7-495) 334-74-21; fax (7-495) 334-76-20; e-mail: fizmat@maik.ru; URL: <http://www.fml.ru/>)

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