

New books on physics and related sciences

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Mazalov V N, Peresvetov V V, Smagin S I *Modeling Electromagnetic Fields in Layered Media with Inclusions* (Vladivostok: Dal'nauka, 2000) 292 pp. Bibliography: 226 refs. ISBN 5-7442-1192-6.

This book summarizes the results of investigation into the mathematical modeling of harmonic electromagnetic fields in layered media that may contain two- and three-dimensional inclusions. It details the theoretical and practical aspects of developing effective numerical algorithms to solve relevant electrodynamic problems using such techniques as integral transforms, the finite-element region-decomposition scheme, and integral equations. The application of the developed simulation algorithms to electromagnetic fields encountered in geophysics is illustrated. The book will be a useful reference tool for specialists and undergraduate and post-graduate students involved with the mathematical modeling of electromagnetic fields in complex media. (RAS Far-East Branch "Dal'nauka" Press regular mail address: 690041 Vladivostok, ul. Radio 7)

Medvedev N N *The Voronoï—Delone Method in Structural Studies of Noncrystalline Systems* (Novosibirsk: NITs OIGGM SO RAN, SO RAN Publ., 2000) 214 pp. Bibliography: 277 refs. ISBN 5-7692-0248-3. RFBR project 99-03-46007.

This monograph presents a geometric approach to exploring the structure of noncrystalline systems arising in the computer simulation of liquids, glasses, and ball packing arrangements of various types. Topics include the mathematical foundations of the method, methodological aspects, and specific applications to physicochemical problems where the arrangement of atoms and the structure of the empty space between them are crucial. The book is intended for researchers and undergraduate and post-graduate students who employ computer simulation in solving structural problems in physics, chemistry, and materials science. Although no background knowledge of geometry is assumed, the book is written at a level which allows the reader to use the method in his or her work. (OIGGM SO RAN Science Publ. Centre regular mail address: 630090 Novosibirsk, prosp. Akad. Koptyuga 3)

Akhadov Ya Yu *Dielectric Parameters of Pure Liquids* Handbook (Moscow: MAI Publ., 1999) 856 pp. Bibliography: 1917 refs. ISBN 5-7035-2063-0. RFBR project 96-03-46025.

This contemporary guide to the dielectric properties of pure liquids starts with a brief survey of the current theories of dielectrics and then describes major methods for measuring the dielectric constant and dielectric losses. For each of more

than a thousand liquids listed, the book provides the magnitudes of the static dielectric constant; limiting high-frequency permittivity; dynamic dielectric constant and dielectric losses; relaxation times and relaxation time distribution factor; the energy, heat, and entropy of dielectric relaxation activation over a wide range of frequencies and temperatures as well as the empirical formula and molecular weight; freezing and boiling points, and the index of refraction and density at 25°C. Intended for physicists, chemists, biologists, engineers and technicians in scientific research institutes and research laboratories, the book will also be a very useful reference for physics, electrical engineering, and other laboratories in the educational environments at various levels. (MAI Publ. regular mail address: 125871 Moscow, Volokolamskoe shosse 4)

Volkov A V, Golovashkin D L, Doskolovich L L, Kazanskii N L, Kotlyar V V, Pavel'ev V S, Skidanov R V, Soifer V A, Solov'ev V S, Usplen'ev G V, Kharitonov S I, Khonina S N *Methods of Computer Optics* (Ed. by V A Soifer) (Moscow: Fizmatlit, 2000) 688 pp. Bibliography: 680 refs. ISBN 5-9221-0051-3.

This book provides an introduction to the computer synthesis of multifunctional diffraction optical elements (DOEs). It discusses methods for the preparation of zone plates with a complex profile of zones and gives particular attention to mathematical models and calculation methods for treating DOEs, including geometrical optics calculations, iterative and gradient algorithms, and rigorous electromagnetic approaches. DOE types covered comprise focusers, modans, laser beam formers with invariant properties, multiorde gratings, axicons, and multifocal lenses. All these DOE types find application in laser radiation focusing, optical fiber and integrated-optics-based laser systems, and optical data processing techniques. Discretization and quantization problems of diffraction optics and various phase microrelieving technologies are also discussed. For specialists and undergraduate and post-graduate students in applied mathematics, informatics, and optics. ('Fiziko-Matematicheskaya Literatura' MAIK 'Nauka/Interperiodika' Publishing regular mail address: 117864 Moscow, P.O. V-485, Profsoyuznaya ul. 90)

Feinberg E L *The Epoch and the Personality. Physicists. Essays and Memoirs* (Volume in the series 'Science. World Outlook. Life') (Moscow: Nauka, 1999) 302 pp. ISBN 5-02-002460-0.

Most of the essays in this collection are the author's reminiscences about prominent Russian physicists with whom he has had more or less close relations for many decades, but there is also a memoir about N Bohr and an essay about W Heisenberg. Although all the essays — with one exception — have already been published, they have been substantially enlarged in the new times in Russia when the

archives became accessible. It succeeded by itself that they are combined through the mediation of the problem having given the title to the book. For a wide circle of readers interested in how scientists involved in the creation of 20-century physics lived and worked. (Nauka Publ. regular mail address: 117864 GSP-7, Moscow V-485, Profsoyuznaya ul. 90; tel. (7-095)334-9859)

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