PACS number: 01.30.Tt

New books on physics and related sciences

Science in Russia: Nowadays and Days to Come The collection of popular science articles (Ed. by V P Skulachev) (Moscow: Academia, 1999) 416 pp. ISBN 5-87444-113-1.

The contributors to this collection are the prize winners of the Russian Foundation for Basic Research (RFBR) popular science writing competition, whose categories — 'Mathematics and mechanics', 'Physics and astronomy', 'Chemistry', 'Biology and medicine', 'Earth sciences', and 'Humane and social sciences' — gave their names to the sections of the book. Of 135 popular science articles by Russian RFBR-funded competitors, 43 were selected by experts for publication. All publication and prize awarding expenses were covered by the RFBR. The book is intended for researchers, undergraduate and post-graduate students, and research management. (Academia Publ. regular mail address: 117810 Moscow, Maronovskiĭ per. 26; tel./fax (7-095) 238-2510, (7-095) 554-4151.

Likhachev V A, Shudegov V E Principles of Organization in Amorphous Structures (St. Petersburg: StPb State University Publ., 1999) 228 pp. Bibliography: 428 refs. ISBN 5-288-01763-8.

This book provides a systematic presentation of the current state of knowledge about the amorphous substance constitution and the principles underlying their structure formation. Emphasis is placed on inorganic glasses and amorphous metals. Topics addressed include the filling of space by disordered atomic configurations; the physical and geometrical aspects of noncrystalline states; elementary theory of glasses; computer simulation of glass structures and glass formation and amorphization processes, and results of numerous system-specific molecular dynamics calculations. The role of disclination type defects, such as disclinations, dispirations, and displanations, in the formation of amorphous materials is examined and their fundamental importance for the physics of the noncrystalline state is demonstrated. For specialists in the physics and chemistry of glass, and for a wide range of readers interested in modern problems in solid-state physics and in the physics and mechanics of new materials. (StPb State University Publ. regular mail address: 199034 St. Petersburg, Universitetskaya nab. 7/9)

Vladimirskaya E V, Gasumyants V É, Il'in V I, Makarova T L *Russian-English Dictionary and English Phraseology for New Areas in Semiconductor Physics* (General Editors V I Il'yin, A Ya Shik) ('New Areas in Semiconductor Physics' textbook series) (St. Petersburg: Nauka, 2000) 108 pp. Bibliography: 15 refs. ISBN 5-02-026137-8.

This book was supported by the target-oriented federal program 'State Support for the Integration of Higher Education and Basic Science for 1997-2000'. The first part of the book is a Russian-English dictionary of new terms and

Uspekhi Fizicheskikh Nauk **171** (1) 119–120 (2001) Translated by E G Strel'chenko DOI: 10.1070/PU2001v044n01ABEH000924

notions currently being used in the scientific literature on the semiconductor physics, solid-state physics, and nanoelectronics (about 1,000 entries). The second part has been designed as a reference text for those intending to write papers in English on research in new areas of semiconductor physics and nanoelectronics. In this part, which is structured as a scientific paper, the basic paper elements - the abstract, introduction, description of the method and the subject, results of an investigation and their discussion, conclusions, and acknowledgments - are all addressed in sequence. An Anglo-Russian abbreviations dictionary in the appendix lists abbreviations used in the first part of the book. The book is recommended by the RF Ministry of Education as a manual for college students specializing in 'Applied Physics'. Intended for students who study English as part of their humanities curriculum and for students preparing an English-language publication of the results of their research. A useful reference for post-graduate students and competitors for the scientific degree as well. (St. Petersburg RAS Nauka Publ. regular mail address: 199034 St. Petersburg, Mendeleevskaya lin. 1)

Valiev R Z, Aleksandrov I V Nanostructure Materials Prepared by Intense Plastic Deformation (Moscow: Logos, 2000) 272 pp. Bibliography: 414 refs. ISBN 5-88439-135-8.

Interest in nanomaterials has been driven by the discovery of their unique physical and unusual mechanical properties and by their great potential for applications. This monograph examines the material preparation and discusses techniques for the study of their structure and properties, placing special emphasis on nanomaterials prepared by intense plastic deformation techniques. The latter were devised with the active participation of the authors. The book preparation was supported by the target-oriented federal program 'State Support for the Integration of Higher Education and Basic Science for 1997–2000'. For specialists and undergraduate and post-graduate students in solid-state physics and mechanics. Those engaged in developing new materials will also find it a valuable source. (Logos Publ. Inc. regular mail address: 105318 Moscow, Izmaĭlovskoe sh. 4)

Synergetics Proceedings of a seminar Vol. 3 Round table 'Self-Organization and Synergetics: Ideas, Approaches, and Prospects' (Ed. by V A Sadovnichiĭ, S P Kurdyumov, V S Stepin) (Moscow: MSU Publ., 2000) 368 pp. ISBN 5-211-02579-2. This third collection of papers on synergetics concentrates on self-organization phenomena in a variety of systems that are of interest in physics, biology, and social sciences. Most of the contributed papers are based on the discussions at the round table 'Self-Organization and Synergetics: Ideas, Approaches, and Prospects' held at Moscow State University, Moscow on 21 October 1999 and talks given at the 1999 'Synergetics' seminar. The book will be useful to researchers and teachers in natural sciences and humanities, specialists and nonspecialists alike, and will also appeal to a wide range of general readers. (MSU Publ. regular mail address: 103009 Moscow, B Nikitskaya ul. 5/7)

New Magnetic Materials in Microelectronics Proceedings of the 17th International School-Seminar (20–23 June 2000, Moscow) (Moscow: URSS Publ., 2000) 889 pp. ISBN 5-88417-225-7.

This is a collection of papers and abstracts presented at the 17th International School-Seminar on New Magnetic Materials in Microelectronics — the school-seminar organized by the Magnetic Films subsection of the Magnetism section of the RAS Physics of Condensed Matter Science Council. The scope of this particular meeting was greatly enlarged by including the subjects normally covered by the All-Russian Physics of Magnetic Phenomena conference, skipped this year for a number of reasons. Abstracts and papers on teaching magnetism in colleges are also included. The meeting was financially supported by the RFBR (project 00-02-26009), the RF Ministry of Science and Technology, and the Moscow Committee for Science and Technology (project G-52). (URSS Publ. regular mail address: 111672 Moscow, ul. Novokosinskaya 27/174)

Koldoba A V, Poveshchenko Yu A, Samarskaya E A, Tishkin V F *Methods for Environmental Mathematical Modelling* (Moscow: Nauka, 2000) 254 pp. Bibliography: 118 refs. ISBN 5-02-002352-3.

This monograph is concerned with the mathematical modelling of some natural processes and objects. It examines such areas of geophysics as underground hydrodynamics and geomechanics, hydrodynamics of water reservoirs and the atmosphere, and the physics of clouds. Some of the book's sections deal with thermodynamics, partial differential equations averaging of differential equation, and turbulence. The application of mathematical models to specific geophysical problems is illustrated with examples. For undergraduate and post-graduate students in physical and mathematical disciplines, and for specialists engaged in environmental modelling. (Nauka Publ. regular mail address: 117864 GSP-7, Moscow V-485, Profsoyuznaya ul. 90)

New Polytechnic Dictionary (Ed.-in-Chief A Yu Ishlinskiĭ) (Moscow: Bol'shaya Rossiĭskaya Éntsiklopediya, 2000) 671 pp. ISBN 5-85270-322-2.

While the New Polytechnic Dictionary is an easy-access general-reader-oriented encyclopedic volume, specialists will also find it valuable as a handy reference and as a thesaurus of terms. Drawing mainly on the information and data collected for previous editions, the dictionary also uses material from encyclopedias and from some other dictionaries, both universal and special. It consists of more than 10,000 articles and has about 1,200 illustrations. Each entry generally defines, and often explains etymologically, the term or the concept (process, mechanism, instrument, material, law, etc.), then briefly describes it and indicates its intended use or function. Many of the entries deal with traditional branches of industry, such as mechanical engineering, power engineering, transport, civil engineering, metallurgy, communication, and the mining and processing of mineral resources. This edition features many new entries on the priority areas of science and technology, including electronics, informatics, quantum mechanics, nuclear physics, aviation, radiophysics and space research. The dictionary also includes entries on novel technologies that have their origins in the employment of plasma, ultrasonic waves, focused electron flows, and laser, infrared, and other radiation, as well as application-oriented entries on astronomy, architecture, geology, medicine,

applied aesthetics, etc. A series of appendices offer tables of physical quantities, both base and derived, the values of fundamental constants, nonmetric old Russian units of measurements, prefixes and multipliers for decimal and fractional units, and more. (Science Publishing 'Bol'shaya Rossiĭskaya Éntsiklopediya' regular mail address: 109028 Moscow, Pokrovskiĭ bul'var 8)

Osipov Yu S The Academy of Sciences in the History of the Russian State (Moscow: Nauka, 1999) 208 pp. ISBN 5-02-011758-7.

This edition publishes, in both Russian and English, materials from the statements and speeches made by the author in his capacity as the President of the Russian Academy of Sciences at RAS's 275th anniversary celebration events. Highlighted in these materials are the historical aspects of the foundation and development of the Russian Academy of Sciences, and the role the Academy has played in the history of the Russian state. (Nauka Publ. regular mail address: 117864 GSP-7, Moscow V-485, Profsoyuznaya ul. 90)

Nesmevanov A N Swinging with the 20th Century (Nauka series in 'Science. World-Outlook. Life'. Exec. ed. Yu N Bubnov) (Moscow: Nauka, 1999) 308 pp. ISBN 5-02-008271-6. The memoirs of Aleksandr Nikolaevich Nesmeyanov, published to coincide with two significant dates: the 275th anniversary of the Russian Academy of Sciences (1724) and the 100th anniversary of the author's birth (9 September 1899), cover the period from 1900 to 1974 and describe the paths Russian science and its creators followed in the 20th century. A N Nesmeyanov went all the way from a Moscow State University chemistry student to the University's head, and from a Junior Researcher to the President of the Academy of Sciences of what was then the USSR. The author gives us his view of the development of science and analyzes the reasons why some areas, notably genetics, were hindered in their progress. Of great interest are the author's recollections of his business contacts with state leaders and with prominent Russian and foreign scientists. For a wide range of readers. [Nauka Publ. regular mail address: 117864 GSP-7, Moscow, V-485 Profsoyuznaya ul. 90; tel. (7-095) 334-9859]

A N Nesmeyanov Institute of Organoelemental Compounds: Past and Present (Exec. eds M I Kabachnik, Yu N Bubnov) (Moscow: Nauka, 1999) 395 pp. ISBN 5-02-004408-3. RFBR project 99-03-46003.

This volume looks at the history of the RAS A N Nesmeyanov Institute of Organoelemental Compounds (Russ. abbr. INÉOS), the leading research center in the field of the chemistry of hetero-organic and high-molecular compounds. The book commemorates the 100th anniversary of the birth of Academician A N Nesmeyanov, INÉOS's founder and first director. Combining the memoirs of the Institute's leading researchers with abundant archival materials, the book introduces the reader to the basic research areas of the Institute, conveys the feeling of its creative atmosphere, and portrays its most prominent scientists. For chemists and for undergraduate and post-graduates students in chemistry colleges. [Nauka Publ. regular mail address: 117864 GSP-7, Moscow, V-845, Profsoyuznaya ul. 90; tel. (7-095) 334-9859]

Compiled by E V Zakharova