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I.K. Kikoin — Physics and Fate ('Monuments of Russian Science. 20th Century' Series; Exec. Ed. S S Yakimov) (Moscow: Nauka, 2008) 933 pp. ISBN 978-5-02-036628-2.

This book is devoted to the 100th anniversary of the birth of the outstanding Soviet scientist Academician Isaak Konstantinovich Kikoin. It consists of four parts. The first includes a selection of I K Kikoin's scientific works, beginning with his first one-page publication of 1929 and ending with a paper published after Isaak Konstantinovich's death in 1986. An entire era passed between these two publications, with a huge number of brilliant original papers, most of them on solid-state physics; he devoted more than half a century to it — practically the whole his life. Part 2 is composed of documents related to the life and work of Academician I K Kikoin at the time when he was working on the Soviet Atomic Project and some declassified reports on the projects he headed at the time. Some of these materials are reprinted from the book *Atomic Project* edited by L D Ryabev, while others are published for the first time. Part 3 presents papers that I K Kikoin wrote on various aspects of pedagogy, philosophy, and social problems. Part 4 is a collection of reminiscences about I K Kikoin, with the most interesting essays written by well-known scientists, industry leaders, his relatives, and his closest collaborators. Some of these contributions were written specially for this volume. The book is intended for research workers, both theoreticians and experimentalists, teachers, students in physics departments, and all those interested in the history of Soviet science. (Akademizdattsentr Nauka RAN: 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/)

Bogoliubov N N *Collected Scientific Works* in 12 volumes ('Classics of Science' Series; Exec. Ed. and Compiler A D Sukhanov)
Statistical Mechanics in 4 volumes, Vol. 7: **Bogoliubov N N, Bogolyubov N N (Jr.) *Introduction to Quantum Statistical Mechanics. Aspects of Polaron Theory*** (Eds N N Bogolyubov (Jr.), A D Sukhanov) (Moscow: Nauka, 2007) 662 pp. ISBN 978-5-02-035724-2. RFBR Project 07-01-070337d.
Statistical Mechanics in 4 volumes, Vol. 8: ***Theory of Nonideal Bose-gas, Superfluidity and Superconductivity: 1946 – 1992*** (Eds N M Plakida, A D Sukhanov) (Moscow: Nauka, 2007) 642 pp. ISBN 978-5-02-035723-5. RFBR Project 07-01-07037.
Quantum Theory in 4 volumes, Vol. 9: ***Quantum Field Theory: 1949 – 1966*** (Eds D V Shirkov, A D Sukhanov) (Moscow: Nauka, 2007) 669 pp. ISBN 978-5-02-035722-8. RFBR Project 07-01-07037.

Uspekhi Fizicheskikh Nauk **178** (5) 559 – 560 (2008)
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Translated by V I Kisin

This is the first attempt to publish a near complete collection of works by N N Bogoliubov — a classic scientist in mathematics and natural sciences — running to twelve volumes. The publication is unique in that the works collected here have never before been published together. Volume 7 contains two famous monographs by N N Bogoliubov and N N Bogolyubov (Jr.): *Introduction to Quantum Statistical Mechanics*, a bibliographical rarity, the likes of which have not been seen for a long time, and *Aspects of the Theory of Polaron*. Their contents reflect the results of research into statistical mechanics that N N Bogoliubov and his disciples carried out after the publication of *Lectures on Quantum Statistics* (1949). The first of the two monographs is a modern-style presentation of the fundamental concepts of quantum statistical mechanics and their applications to the theory of a nonideal Bose gas, superfluidity, and the problems of quasiaverages. The second monograph deals with the theory of the polaron. To give a more complete presentation of the attitude of the authors to the polaron theory, the text of this monograph is accompanied by three complementary articles: a paper by N N Bogoliubov and N N Bogolyubov, Jr. (1980) that is fundamental for the present series of papers; it generalized the ideas of their talk at the International Symposium on the Fundamental Problems of Theoretical and Mathematical Physics in Dubna in 1979, a paper by N N Bogolyubov, Jr. and V N Plechko (1984), and a translation of one of N N Bogoliubov's last publications entitled "Some remarks on the theory of polaron", published in 1990 in Dubna (JINR) in English. Volume 8 contains N N Bogoliubov's fundamental papers on the theory of a nonideal Bose gas and superconductivity of Bose and Fermi systems, which constituted one of the most important achievements of theoretical physics in the 20th century. The ideas presented in them are widely used today to describe Bose – Einstein condensates in magnetooptical traps and high-temperature superconductivity, and also to advance quantum field theory at finite temperatures. A considerable part of the materials in this volume were earlier published as lectures, reports, and preprints and have become accessible to general readers only now. Volume 9 comprises a widely known monograph *Aspects of the Theory of Dispersion Relations* by N N Bogoliubov, B V Medvedev, and M K Polivanov, which went through several editions in Russian and in foreign languages. The last Russian edition (1971) has been a bibliographical rarity for a long time now. This volume also includes the most important papers on the foundations of quantum field theory, the theory of the scattering matrix, progress in renormalization procedure, the method of the renormalization group, and dispersion relations, which were epochal achievements in the mathematical and theoretical physics of the 20th century. The emergence of this volume opens the publication of the concluding four-volume 'Quantum Theory' Series within the *Collection of Scientific Works* of N N Bogoliubov. The series opens with a review article "Nikolai Nikolaevich Bogoliubov in quantum field theory" by D V Shirkov. It presents a

retrospective analysis of N N Bogoliubov's research into quantum field theory, written by his closest student and witness to relevant events, not to mention the co-author of many a paper printed in this volume. On the whole, this volume is unique in that for the first time it systematizes and publishes together N N Bogoliubov's fundamental works on quantum field theory and the axiomatic theory of scattering matrix. Many of them either have never been published in Russian or were 'scattered' over journals and collections of papers that today are barely accessible. These books will serve as an invaluable reference source for students, postgraduates, researchers, and teachers specializing in mathematical physics, statistical mechanics, quantum theory, quantum field theory, and the history of physics. (Akademizdattsentr Nauka RAN: 117997 Moscow, 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/)

Fabrikant V A ***Selected Works*** (Compiled by L M Biberman, translated into English by E G Strel'chenko) (Moscow: Izdatel'skii dom MEI, 2007) 216 pp. ISBN 978-5-383-00145-5.

This volume comprises a collection of the most important publications in Russian and English of the well-known Russian physicist V A Fabrikant (1907 – 1991), the 100th anniversary of whose birth was celebrated in 2007. The topics covered by his work are the study of low-temperature plasmas and electric discharges in gases; the discovery of the principle of quantum amplification of electromagnetic radiation; the experimental study of luminescent probes; the creation of luminescent light sources; the study of diffraction of electrons, and articles popularizing physics and physicists. The complete list of V A Fabrikant's publications is also given. The book is intended for specialists and students interested in the history of physics and in optical and quantum electronics, both in Russia and abroad. (MPEI Publ.: 111250 Moscow, ul. Krasnokazarmennaya 14; tel. (7-495) 361-16-81; tel./fax (7-495) 362-02-13; e-mail: publish@mpei.ru, publish@mpei-publishers.ru; URL: http://www.mpei-publishers.ru/)

Moskalev A N ***Relativistic Field Theory*** A manual (Exec. Ed. A V Nefedov) (St.-Petersburg: PIYaF RAN, 2006) 206 pp. ISBN 5-86763-178-8.

This student's manual presents a course of lectures on the fundamentals of relativistic quantum theory of elementary particles, designed for one term. The manual puts forward the general aspects of relativistic field theory, including the theory of gauge fields, and treats in detail the simplest electromagnetic processes in which electrons take part. The entire approach is based on using the Green function method and Feynman diagrams. The originality of the manual manifests itself in that, on the one hand, all the material is presented in a very digestible form but, on the other hand, calculations are carried out consistently from beginning to end. For this reason, this textbook may prove useful to a fairly broad range of readers. (B P Konstantinov Petersburg Nuclear Physics Institute, RAS: 188300 Gatchina, Leningrad region, Orlova roshcha; tel. (7-813-71) 46025; fax (7-813-71) 36025; URL: http:// www.pnpi.spb.ru)

Potapov A A, Gulyaev Yu V, Nikitov S A, Pakhomov A A, German V A ***The Latest Techniques of Image Processing*** (Gen. Ed. A A Potapov) (Moscow: Fizmatlit, 2008) 496 pp. ISBN 978-5-9221-0841-6. Publication supported by the RFBR, project No. 07-07-07005.

The monograph considers systematically for the first time and generalizes new approaches developed by the authors for applications to the theory of processing distorted and low-contrast images in topical problems of radiophysics, astronomy, optics, and radiolocation. The monograph consists of practically two distinct parts. Based on the apparatus of the Lebesgue integral-valued measure, Part 1 presents a theoretical analysis of unambiguity of reconstruction of one-dimensional signals and images from incomplete information on their Fourier spectra. Hilbert transformations for the relation between the absolute value and phase in the two-dimensional case are obtained using complex variable methods. These new equations can be applied for analytically solving a number of ill-posed problems. If the conditions do not allow an analytical solution to a problem, methods of projections onto convex sets are utilized. Part 2 of the book outlines the results obtained using the fractional measure and fractional dimensionality techniques, as well as fractal approach to processing ultraweak signals and low-contrast images. In this 'fractal' approach, the description and processing of signals and fields is carried out exclusively in the fractional measure space using the scaling hypotheses and 'heavy-tailed' distributions. The efficiency of the methods of fractal filtration is richly illustrated with examples. Principles of synthesizing fractal detectors are outlined. The monograph gives a focused picture of the current stage in the advance of the newest methods of processing signals, images, fields, and pattern recognition, as well as of problems still unsolved. On the whole, no books have been published in this field either in Russia or abroad with such a comprehensive formulation of aspects of application of the theory of integral-valued and fractional measure and integral transformations. The book will be equally valuable to physicists, mathematicians, and specialists interested in new ideas and methods of processing signals, images, and pattern recognition, as well as postgraduates and students majoring in the appropriate fields. ('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, fmlsale@maik.ru; URL: http://www.fml.ru)

Barybin A A ***Electrodynamics of Waveguiding Structures: Theory of Wave Excitation and Coupling*** (Moscow: Fizmatlit, 2008) 512 pp. ISBN 5-9221-0740-2.

The self-consistent theory of excitation and coupling of waveguide modes was developed based on fundamental concepts of electrodynamics that work for any (both closed and open) waveguiding structure. Waveguiding structures incorporating media with isotropic, anisotropic, and bi-anisotropic properties are considered, The analysis is performed taking into account energy dissipation in these media. As an application of the general theory, the book considers planar optical waveguides used in integral optics, electro-optics, acousto-optics, and magnetooptics. Modal coupling coefficients are obtained as a particular case of general expressions that take account of statistical and dynamic parametric perturbations in relation to directed and radiating modes of open dielectric waveguides. The results of the last two chapters may serve as a basis for developing applied

programs meant for numerical computations of various devices for waveguide optics. The book is intended for students, postgraduates, and teachers at institutes and universities, as well as for specialists in theoretical and applied electrodynamics, integral optics, acousto-optics, electrooptics, and magnetooptics. ('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, fmlsale@maik.ru; URL: http://www.fml.ru)

Aleksandrov M T *Clinical Laser Biophotometry*: *Theory, Experiment, and Practice* ('The World of Biology and Medicine' Series) (Moscow: Tekhnosfera, 2008) 584 pp. ISBN 978-5-94836-148-2.

The book presents the experimental and theoretical development and the results of clinical applications of laser irradiation and laser techniques in medical biotechnologies. Aspects of biological effects of laser radiation at the subcellular, cellular, tissue, systemic, and organismal levels are described. A definition is given and the concepts of clinical laser biophotometry are substantiated. Practical applications are shown of laser biophotometry as a clinical medical and diagnostic discipline in contaminated surgery, stomatology, dermatology, cosmetology, oncology, child surgery, obstetrics and gynecology, proctology, clinical microbiology, and functional, screening, differential, and network diagnostics. Prospects of extending the method to medical, industrial, and food-processing biotechnologies are presented. The monograph has been published based on a decision by the Presidium of the Russian Academy of Medical Sciences and the Learned Council of the I M Sechenov Moscow Medical Academy. The book was awarded the Russian Federation Prize for Science and Technology. (Tekhnosfera Publ. 127473 Moscow, ul. Krasnoproletarskaya 16, str. 2; tel. (7-495) 234-01-10, fax (7-495) 956-33-46; e-mail: pochta@tehnosphera.ru; URL: http: //www. technosphera. ru/)

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