

## New books on physics and related sciences

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**Ginzburg V L** *The Physics of a Lifetime. Reflections on the Problems and Personalities of 20th Century Physics* (Berlin: Springer, 2001) 513 pp. ISBN 978-3-642-08699-1.

Every reader interested in understanding the important problems in physics and astrophysics and their historic development over the past 60 years will enjoy this book immensely. The philosophy, history, and individual views of famous scientists of the 20th century known personally to the author make this book fascinating for nonphysicists, too. The book consists of three parts on (I) the major problems of physics and astrophysics, (II) the philosophy and history of science, and (III) memorial essays on famous physicists. The author is an internationally renowned scientist who summarizes here his life-long experience. (Springer-Verlag: Haberstrasse 7 D-69126 Heidelberg, Germany; tel. +49 6221 345-4301; fax: +49 6221 345-4229; orders-HD-individuals@springer.com; URL: <http://www.springer.com/>)

**Ginzburg V L** *On Superconductivity and Superfluidity. A Scientific Autobiography* (Berlin: Springer, 2009) 232 pp. ISBN 978-3-540-68004-8.

This book presents Nobel Laureate Vitaly Ginzburg's views on development in the field of superconductivity. It contains a selection of Ginzburg's key writings, including his amended version of the Nobel lecture in Physics 2003. Also included are an expanded autobiography, which was written for the Nobel Committee, an article entitled "A scientific autobiography: an attempt," a fundamental article co-written with L D Landau and entitled "To the theory of superconductivity," an expanded review article "Superconductivity and superfluidity (what was done and what was not done)," and some newly written short articles about superconductivity and related subjects. So, in toto, presented here are the personal contributions of Ginzburg that resulted in the Nobel Prize in the context of his scientific biography. (Springer-Verlag: Haberstrasse 7 D-69126 Heidelberg, Germany; tel. +49 6221 345-4301; fax: +49 6221 345-4229; orders-HD-individuals@springer.com; URL: <http://www.springer.com/>)

**Kadomtsev B B (Kadomtsev B B)** *On the Pulsar* (Foreword by A Nomerotsky) (Singapore: World Scientific Publ. Co., 2009) 148 pp. ISBN 978-981-4289-72-6, 981-4289-72-8, 978-981-4289-74-0(ebook), 981-4289-74-4(ebook).

This book serves as a good introduction to the physics of pulsars by explaining the subject matter in simple terms which

are understandable both to undergraduate physics students and to the general public. *On the Pulsar* links together ideas about physics, informatics, and biology, and contains many original examples, problems, and solutions. It starts with simple examples about the regular structures that are possible in strong magnetic fields, and the author then suggests that special conditions on the pulsar can result in some forms of self-organization. It will also make a valuable teaching guide. Readership: Students and the general public interested in astrophysics and informatics. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Feinberg E L** *Physicists: Epoch and Personalities* (History of Modern Physical Sciences series, Vol. 4, edited by I M Dremin, translated by A V Leonidov) (Singapore: World Scientific Publ. Co., 2010) 436 pp. ISBN 978-981-283-416-4, 981-283-416-8.

The book is a collection of memoirs on famous Soviet physicists of the 20th century: Tamm, Vavilov, Sakharov, Landau, and others. The memoirs were originally written in Russian by E L Feinberg. The narrative is situated within a remarkably well-described historical, cultural, and social context. Of special interest are the chapters devoted to the Soviet and German atomic projects.

Contents:

- Leonid Isaakovich Mandelstam
- Igor Evgenjevich Tamm
- Andrei Dmitrievich Sakharov
- Sergei Ivanovich Vavilov
- Mikhail Aleksandrovich Leontovich
- Aleksandr L'vovich Mintz
- Niels Hendrik David Bohr
- Werner Karl Heisenberg
- What Brought Hitler to Power? And Who?
- Lev Davidovich Landau

Readership: Academics and general readers interested in the history of science. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Fortov V E** *Extreme States of Matter on Earth and in the Universe* (The Frontiers Collection series) 1st ed. (Berlin: Springer, 2011) 350 pp. ISBN 978-3-642-16463-7 (to be published in November 2010).

With its many beautiful color pictures, this book gives fascinating insights into the unusual forms and behavior of matter under extremely high pressures and temperatures. These extreme states are generated, among other things, by strong shock, detonation, and electric explosion waves,

dense laser beams, electron and ion beams, hypersonic entry of spacecraft into dense atmospheres of planets, and in many other situations characterized by extremely high pressures and temperatures. Written by one of the world's foremost experts on the topic, this book will inform and fascinate all scientists dealing with materials properties and physics, and also serve as an excellent introduction to plasma, shock-wave, and high-energy-density physics for students and newcomers seeking an overview. (Springer-Verlag: Haberstrasse 7 D-69126 Heidelberg, Germany; tel. +49 6221 345-4301; fax: +49 6221 345-4229; orders-HD-individuals@springer.com; URL: <http://www.springer.com/>)

**Blokh A M** *Soviet Union in the Context of the Nobel Prize* (Singapore: World Scientific Publ. Co., 2011) 900 pp. ISBN 978-981-4277-97-6 981-4277-97-5 (to be published in 2011).

The result of meticulous research by Professor Abram Blokh, this book presents facts, documents, thoughts, and comments on the system of the Nobel Prize awards to Russian and Soviet scientists. It provides a comprehensive overview of the relationship between the ideas expressed by the Nobel Foundation and those expressed by the autocratic and totalitarian regimes in Russia and the former Soviet Union during the 20th century, who had the same attitude of revulsion toward the intellectual and humanistic values represented by the Nobel Prizes. To do his research, the author had access to declassified documents in the archives of the Nobel Foundation for many years. Also included in the book is new material obtained and developed by the author after the publication of the first two editions (in Russian). This additional information is from the archives of the Soviet Ministry of Foreign Affairs, the Russian Academy of Sciences, the Soviet Writers' Union, etc. in Moscow and St. Petersburg. These documents shed new light on the difficulties encountered during the attempts to integrate Russian and Soviet science into the world's intellectual community. This book would be of utmost interest to those who are interested in the history of science in Russia and the former Soviet Union related to the Nobel Prize. Readership: Historians, scientists, academics, and students. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Okun L B** *Energy and Mass in Relativity Theory* (Singapore: World Scientific Publ. Co., 2009) 324 pp. ISBN 978-981-281-411-1, 981-281-411-6, 978-981-281-412-8(ebook), 981-281-412-4(ebook).

*Energy and Mass in Relativity Theory* presents about 30 pedagogical papers published by the author over the last 20 years. They deal with concepts central to relativity theory: energy  $E$ , rest energy  $E_0$ , momentum  $\mathbf{p}$ , mass  $m$ , and velocity  $\mathbf{v}$  of particles of matter, including massless photons for which  $v = c$ . Other related subjects are also discussed. According to Einstein's equation  $E_0 = mc^2$ , a massive particle at rest contains rest energy which is partly liberated in the nuclear reactions in the stars and the Sun, as well as in nuclear reactors and bombs on Earth. The mass entering Einstein's equation does not depend on velocity of a body. This concept of mass is used in the physics of elementary particles and is gradually prevailing in modern physics

textbooks. This is the first book in which Einstein's equation is explicitly compared with its popular though not correct counterpart  $E = mc^2$ , according to which mass increases with velocity. The book will be of interest to researchers in theoretical, atomic, and nuclear physics, to historians of science, and to students and teachers interested in the theory of relativity. Readership: Researchers, academics, and students in physics, history, and the philosophy of science. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Gorbunov D S, Rubakov V A** *Introduction to the Theory of the Early Universe: Hot Big Bang Theory* (Singapore: World Scientific Publ. Co., 2010) 500 pp. ISBN 978-981-4322-24-9, 981-4322-24-5 (to be published in December 2010).

This book is written from the viewpoint of the deep connection between cosmology and particle physics. It presents the results and ideas of both the homogeneous and isotropic Universe at the hot stage of its evolution and in later stages. The main chapters describe in a systematic and pedagogical way established facts and concepts on the early and the present Universe. Hence, the comprehensive treatment serves as a modern introduction to this rapidly developing field of science. To help in reading the chapters without having to constantly consult other texts, essential materials from General Relativity and the theory of elementary particles are collected in the Appendices. Various hypotheses dealing with unsolved problems of cosmology, which often contradict each other, are discussed at a more advanced level. These concern dark matter, dark energy, matter-antimatter asymmetry, etc. Readership: Cosmologists, advanced undergraduate and postgraduate students. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Gorbunov D S, Rubakov V A** *Introduction to the Theory of the Early Universe: Cosmological Perturbations and Inflationary Theory* (Singapore: World Scientific Publ. Co., 2010) 480 pp. ISBN 978-981-4322-22-5, 981-4322-22-9 (to be published in December 2010).

This book accompanies another book by the same authors, *Introduction to the Theory of the Early Universe: Hot Big Bang Theory*, and presents the theory of the evolution of density perturbations and relic gravity waves, the theory of cosmological inflation, and post-inflationary reheating. Written in a pedagogical style, the main chapters give a detailed account of the established theory, with derivations of formulas. Being self-contained, it is a useful textbook for advanced undergraduate and postgraduate students. Essential material from General Relativity, the theory of Gaussian random fields, and quantum field theory are collected in the Appendices. The more advanced topics are approached similarly in a pedagogical way. These parts may serve as a detailed introduction to current research. Readership: Cosmologists, advanced undergraduate and postgraduate students. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

**Mensky M B** *Consciousness and Quantum Mechanics: Life in Parallel Worlds. Miracles of Consciousness from Quantum Reality* (Singapore: World Scientific Publ. Co., 2010) 272 pp. ISBN 978-981-4291-42-2, 981-4291-42-0.

The phenomenon of consciousness includes mysterious aspects providing a basis for many spiritual doctrines (including religions) and psychological practices. These areas of human knowledge are usually considered to contradict the laws of science. However, quantum mechanics — in a sense, the mysterious area of science — allows us to include the phenomena of consciousness and life, as well as relevant phenomena in the sphere of science. Wolfgang Pauli, one of the pioneers of quantum mechanics, together with the great psychologist Carl Gustav Jung, guessed about the relation between quantum mechanics and consciousness at the beginning of the twentieth century. However, only the ‘many-worlds’ interpretation of quantum mechanics, proposed in 1957 by Hugh Everett III, gave the real basis for the systematic investigation of this relation. Roger Penrose, one of the apologists of the relation between quantum mechanics and consciousness, claimed in his last book, *The Road to Reality*, that Everett’s interpretation may be estimated only after creating the theory of consciousness. Against this notion, the author proposed in 2000 and further elaborates in this book the so-called Extended Everett’s Concept, which allows one to derive the main features of consciousness and superconsciousness (intuition, or direct vision of truth) from quantum mechanics. This is exposed in this book in a form intelligible for a wide audience. Readership: Quantum physicists and nonexperts (including students) interested in the foundations of quantum mechanics; people interested in mysterious phenomena of the mind and the possibility of their scientific explanation. (World Scientific Publishing Co. Pte. Ltd.: 5 Toh Tuck Link, Singapore 596224; tel. 65-6466-5775; fax 65-6467-7667; e-mail: sales@wspc.com.sg; URL: <http://www.worldscibooks.com/>)

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