

Accelerator Physics and Experimental Physics

2010

AT THE LEADING EDGE

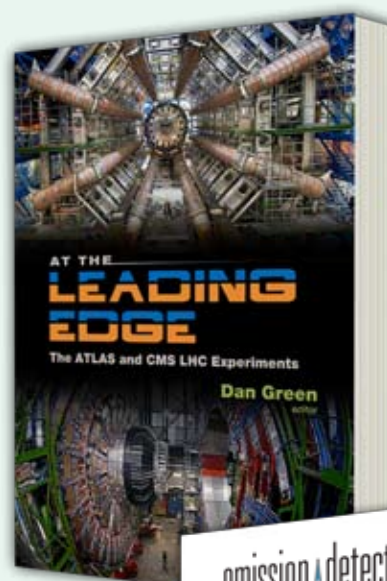
The ATLAS and CMS LHC Experiments

edited by **Dan Green** (*Fermi National Accelerator Laboratory, USA*)

This volume aims to elucidate how the requirements of the physics at the Large Hadron Collider (LHC) define the detector environment. LHC physics requires fast, finely segmented, low noise and radiation resistant detectors, which provide redundant measurements of the rarely produced electrons and muons. To achieve those goals, new ground was broken in constructing the AToroidal LHC Apparatus (ATLAS) and Compact Muon Solenoid (CMS) detectors in the vertex detectors, tracking systems, calorimetry, strong magnets, muon systems, front end electronics, trigger systems, and in the data acquisition methods used.

Readership: Physicists and graduates in particle physics.

500pp (approx.) Winter 2009
978-981-4277-61-7 US\$120 £90



EMISSION DETECTORS

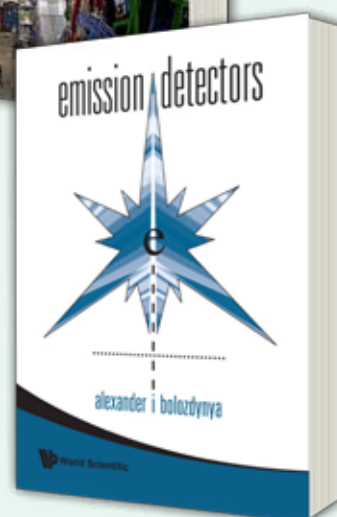
by **Alexander I Bolozdynya** (*Case Western Reserve University, USA*)

After decades of research and development, emission detectors have recently become the most successful instrumentation used in modern fundamental experiments searching for cold dark matter, and are also considered for neutrino coherent scattering and magnetic momentum neutrino measurement. This book is the first monograph exclusively dedicated to emission detectors. Properties of two-phase working media based on noble gases, saturated hydrocarbon, ion crystals and semiconductors are reviewed.

Contents: Introduction: Heterophase Detectors and History of Development of Emission Detectors; Detection Media and Their Properties; Physics of Generation of Signals in Emission Detectors; Basics of Technology of Emission Detectors; Ionization Emission Detectors; Emission Detectors with Physical Amplification of Signals; Imaging Emission Detectors; Applications of Emission Detectors.

Readership: Detector physicists and experimentalists, nuclear engineers, materials scientists, and advanced graduate students in physics and medical imaging.

320pp (approx.) Winter 2009
978-981-283-405-8 US\$88 £48



HIGHLIGHTS

REVIEWS OF ACCELERATOR SCIENCE AND TECHNOLOGY Pg 2

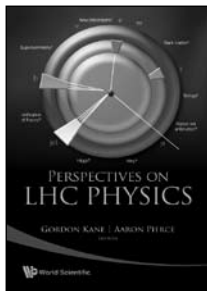
edited by **Alexander W Chao** (*Stanford Linear Accelerator Center, USA*) & **Weiren Chou** (*Fermi National Accelerator Laboratory, USA*)

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PHENOMENOLOGY OF ULTRA-RELATIVISTIC HEAVY-ION COLLISIONS Pg 6

by **Wojciech Florkowski** (*Jan Kochanowski University, Poland and Polish Academy of Sciences, Poland*)



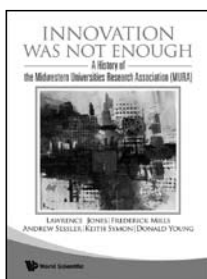
PERSPECTIVES ON LHC PHYSICS

edited by **Gordon Kane & Aaron Pierce**
(University of Michigan, USA)

This book provides an overview on the techniques that will be crucial for finding new physics at the LHC, as well as perspectives on the importance and implications of the discoveries. Among the accomplished contributors to this book are leaders and

visionaries in the field of particle physics beyond the Standard Model, including two Nobel Laureates (Steven Weinberg and Frank Wilczek), and presumably some future Nobel Laureates, plus top younger theorists and experimenters. With its blend of popular and technical contents, the book will have wide appeal, not only to physical scientists but also to those in related fields.

352pp **Jul 2008**
978-981-277-975-5 **US\$93** **£55**
978-981-283-389-1 (pbk) **US\$51** **£30**



INNOVATION WAS NOT ENOUGH

A History of the Midwestern Universities Research Association (MURA)

by **Lawrence Jones** (University of Michigan, USA), **Frederick Mills, Donald Young** (Fermi National Accelerator Laboratory, USA), **Andrew Sessler** (Lawrence Berkeley National Laboratory, USA) & **Keith Symon** (University of Wisconsin-Madison, USA)

This book presents a history of the Midwestern Universities Research Association (MURA) during its lifetime from the early 1950s to the late 1960s. MURA was responsible for a number of important contributions to the science of particle accelerators, including the invention of fixed field alternating gradient accelerators (FFAG), as well as contributions to accelerator orbit theory, radio frequency acceleration techniques, colliding beams technology, orbit instabilities, computation methods, and designs of accelerator magnets and linear accelerator cavities.

Readership: Academic, industrial and laboratory personnel interested in high energy physics, particle accelerators and the history of science.

150pp (approx.) **Fall 2009**
978-981-283-283-2 **US\$38** **£21**

ENGINES OF DISCOVERY

A Century of Particle Accelerators

by **Andrew Sessler** (Lawrence Berkeley National Laboratory, USA) & **Edmund Wilson** (CERN, Geneva, Switzerland)

"Thanks to the fresh and pleasant language that Sessler and Wilson use, Engines of Discovery should appeal to anybody interested in the history of scientific progress ... With this book, the authors ensure that the enthusiasm that has led so many people to dedicate their lives to this branch of physics will continue to grow."

Physics Today

Readership: Scientists, research physicists, engineers and administrators at accelerator laboratories; general readers; undergraduates and graduates in physics, electrical engineering and the history of science.

212pp **Jul 2007**
978-981-270-070-4 **US\$69** **£40**
978-981-270-071-1 (pbk) **US\$39** **£22**

Bestseller



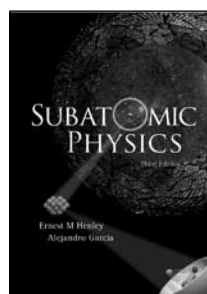
REVIEWS OF ACCELERATOR SCIENCE AND TECHNOLOGY

Volume 1

edited by **Alexander W Chao** (Stanford Linear Accelerator Center, USA) & **Weiren Chou** (Fermi National Accelerator Laboratory, USA)

Contents: Early Milestones in the Evolution of Accelerators (*E D Courant*); Electron Linacs for High Energy Physics (*P B Wilson*); The Development of High Power Hadron Accelerators (*G H Rees*); Cyclotrons and Fixed-Field Alternating-Gradient Accelerators (*M K Craddock & K R Symon*); Particle Colliders for High Energy Physics (*D A Edwards & H T Edwards*); Synchrotron Radiation (*A Hofmann*); Medical Applications of Accelerators (*H Eickhoff & U Linz*); Industrial Accelerators (*R W Hamm*); The Development of Superconducting Magnets for Use in Particle Accelerators: From the Tevatron to the LHC (*A Tollestrup & E Todesco*); Development of Superconducting RF Technology (*T Furuya*); Cooling Methods for Charged Particle Beams (*V V Parkhomchuk & A N Skrinsky*); The Supercollider: the Pre-Texas Days — A Personal Recollection of Its Birth and Berkeley Years (*S Wojcicki*); Accelerators and the Accelerator Community (*A Sessler & E Malamud*); Book Review: Panofsky on Physics, Politics, and Peace: Pief Remembers (*G Loew*); A Brief History of Particle Accelerators (Poster).

340pp **Dec 2008**
978-981-283-520-8 **US\$93** **£55**



SUBATOMIC PHYSICS

Third Edition

by **Ernest M Henley & Alejandro Garcia**
(University of Washington, USA)

This is the third and fully updated edition of the classic textbook on physics at the subatomic level. The coverage includes new material on:

- Detectors and accelerators
- Nucleon elastic form factor data
- Neutrinos, their masses and oscillations
- Chiral theories and effective field theories, and lattice QCD
- Relativistic heavy ions (RHIC)
- Nuclear structure far from the region of stability
- Particle astrophysics and cosmology

Readership: Senior undergraduates, beginning graduates, and advanced engineering students.

640pp **Jul 2007**
978-981-270-056-8 **US\$114** **£71**
978-981-270-057-5 (pbk) **US\$69** **£41**

SUBATOMIC PHYSICS SOLUTIONS MANUAL

Third Edition

by **Ernest M Henley & Alejandro Garcia** (University of Washington, USA)

This is the solutions manual for many (particularly odd-numbered) end-of-chapter problems in *Subatomic Physics, 3rd Edition* by Henley and Garcia. The student who has worked on the problems will find the solutions presented here a useful check on answers and procedures.

Readership: Senior undergraduate, beginning graduate, and advanced engineering students.

80pp **Feb 2008**
978-981-279-745-2 (pbk) **US\$20** **£10**

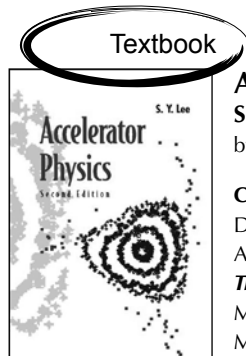
NEW PERSPECTIVES IN HEAVY FLAVOR PHYSICS

by Marina Artuso (Syracuse University, USA)

This book introduces widely accessible formulations of the theory tools needed to relate the experimental data to fundamental theory parameters. In addition, an extensive discussion of the experimental methods used to explore this physics is included. The core of the book is largely devoted to the physics of charm and beauty quark weak decays, with substantial material on top quark masses and weak coupling. In the final chapter, connections with the lepton sectors and the neutrino mass and mixing parameters are drawn.

Readership: Physicists, academics and graduates in particle physics.

400pp (approx.) Summer 2010
978-981-4289-46-7 US\$100 £75



ACCELERATOR PHYSICS Second Edition

by SY Lee (Indiana University, USA)

Contents: *Introduction:* Historical Developments; Layout and Components of Accelerators; Accelerator Applications; *Transverse Motion:* Hamiltonian for Particle Motion in Accelerators; Linear Betatron Motion; Effect of Linear Magnet Imperfections; Off-Momentum Orbit; Chromatic Aberration;

Linear Coupling; Nonlinear Resonances; Collective Instabilities and Landau Damping; Synchro-Betatron Hamiltonian; *Synchrotron Motion:* Longitudinal Equation of Motion; Adiabatic Synchrotron Motion; RF Phase and Voltage Modulations; Nonadiabatic and Nonlinear Synchrotron Motion; Beam Manipulation in Synchrotron Phase Space; Fundamentals of RF Systems; Longitudinal Collective Instabilities; Introduction to Linear Accelerators; *Physics of Electron Storage Rings:* Fields of a Moving Charged Particle; Radiation Damping and Excitation; Emittance in Electron Storage Rings; *Special Topics in Beam Physics:* Free Electron Laser (FEL); Beam-Beam Interaction; *Basics of Classical Mechanics:* Hamiltonian Dynamics; Stochastic Beam Dynamics; *Numerical Methods and Physical Constants:* Fourier Transform; Model Independent Analysis; Cauchy Theorem and the Dispersion Relation; Useful Handy Formulas; Maxwell's Equations; Physical Properties and Constants.

Readership: Senior undergraduates, graduates, researchers and academics is accelerator, high-energy, nuclear, plasma and applied physics.

596pp Dec 2004
978-981-256-182-4 US\$101 £64
978-981-256-200-5(pbk) US\$52 £33

FACTS AND MYSTERIES IN ELEMENTARY PARTICLE PHYSICS

by Martinus J G Veltman (University of Michigan, Ann Arbor, USA & NIKHEF, The Netherlands)

Facts and Mysteries in Elementary Particle Physics offers an incredible insight from an eyewitness and participant in some of the greatest discoveries in 20th century science. From Einstein's theory of relativity to the elusive Higgs particle, this book will fascinate and educate anyone interested in the world of quarks, leptons and gauge theories. Illustrated with pictures, these candid sketches present rare, perceptive views of the characters that populate the field.

Readership: Students, lay people and anyone interested in the world of elementary particles.

348pp May 2003
978-981-238-148-4 US\$61 £51
978-981-238-149-1(pbk) US\$27 £17

SEVENTY YEARS OF DOUBLE BETA DECAY From Nuclear Physics to Beyond-Standard-Model Particle Physics

edited by HV Klapdor-Kleingrothaus (Max-Planck-Institut für Kernphysik, Germany)

This book presents the breathtaking manner in which achievements in particle physics have been made from a nuclear physics process. Consisting of a 150-page highly factual overview of the field of double beta decay and a 1200-page collection of the most important original articles, the book outlines the development of double beta decay research — theoretical and experimental — from its humble beginnings until its most recent achievements, with its revolutionary consequences for the theory of particle physics. It further presents an outlook on the exciting future of the field.

Readership: Particle physicists, nuclear physicists and astrophysicists.

1300pp (approx.) Fall 2009
978-981-283-235-1 US\$198 £107

AN INTRODUCTION TO THE PHYSICS OF PARTICLE ACCELERATORS (Second Edition)

by Mario Conte (INFN, Italy) & William W MacKay (Brookhaven National Laboratory, USA)

This book provides a concise and coherent introduction to the physics of particle accelerators, with attention being paid to the design of an accelerator for use as an experimental tool. In the second edition, new chapters on spin dynamics of polarized beams as well as instrumentation and measurements are included, with a discussion of frequency spectra and Schottky signals. The additional material also covers quadratic Lie groups and integration highlighting new techniques using Cayley transforms, detailed estimation of collider luminosities, and new problems.

Readership: Graduates and advanced undergraduates in physics.

392pp May 2008
978-981-277-960-1 US\$91 £53
978-981-277-961-8(pbk) US\$58 £33



HANDBOOK OF ACCELERATOR PHYSICS AND ENGINEERING (3rd Printing)

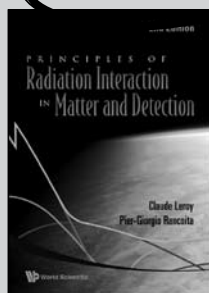
edited by Alexander Wu Chao (Stanford Linear Accelerator Center) & Maury Tigner (Cornell University)

Edited by internationally recognized authorities in the field, this expanded edition of the bestselling Handbook first published in 1999 is aimed at the design and operation of modern accelerators including Linacs, Synchrotrons and Storage Rings. It is intended as a *vade mecum* for professional engineers and physicists engaged in these subjects. With a collection of 2200 equations, 345 illustrations and 185 tables, here one will find, in addition to the common formulae of previous compilations, hard to find, specialized formulae, recipes and material data pooled from the lifetime experience of many of the world's most able practitioners of the art and science of accelerators.

Readership: Physicists, engineers and practitioners in accelerator science.

740pp May 2006
978-981-02-3500-0 US\$105 £71
978-981-02-3858-2(pbk) US\$72 £43

New



PRINCIPLES OF RADIATION INTERACTION IN MATTER AND DETECTION (2nd Edition)

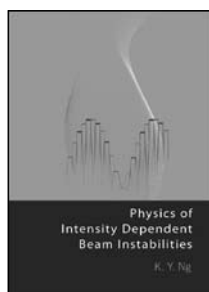
by **Claude Leroy** (*Université de Montréal, Canada*) & **Pier-Giorgio Rancoita** (*Istituto Nazionale di Fisica Nucleare, Milan, Italy*)

This book addresses the fundamental principles of interaction between radiation and matter and the principle of particle detectors in a wide scope of fields, from low to high energy, including space physics and the medical environment.

This second edition includes new sections dedicated to the following topics: space and high-energy physics radiation environment, non-ionizing energy loss (NIEL), displacement damage in silicon devices and detectors, single event effects, detection of slow and fast neutrons with silicon detectors, solar cells, pixel detectors, and additional material for dark matter detectors.

Readership: Researchers, academics, graduate students and professionals in accelerator, particle, applied and medical physics.

952pp **Feb 2009**
978-981-281-827-0 **US\$191** **£112**
978-981-281-828-7(pbk) **US\$104** **£61**



PHYSICS OF INTENSITY DEPENDENT BEAM INSTABILITIES

by **K Y Ng** (*Fermi National Accelerator Laboratory, USA*)

This book provides a comprehensive treatment of intensity dependent particle beam instabilities in accelerating

rings. Although the book is theory oriented, the use of mathematics has been minimized. The presentation is intended to be rigorous and self-contained with nearly all the formulas and equations derived.

Contents: Wakes and Impedances; Potential-Well Distortion; Betatron Tune Shifts; Envelope Equation; Longitudinal Microwave Instability for Coasting Beams; Longitudinal Microwave Instability for Short Bunches; Beam Loading and Robinson's Instability; Longitudinal Coupled-Bunch Instabilities; Transverse Instabilities; Transverse Coupled-Bunch Instabilities; Mode Coupling Instabilities; Head-Tail Instabilities; Landau Damping; Beam Breakup; Two-Stream Instabilities; Instabilities Near and Across Transition.

Readership: Researchers in accelerator physics. Also suitable for use as a textbook for graduate courses.

800pp **Jan 2006**
978-981-256-342-2 **US\$126** **£75**



X-RAY SCATTERING FROM SEMICONDUCTORS

by **Paul F Fewster** (*Philips Analytical Research Centre, UK*)

X-ray scattering is used extensively to provide detailed structural information about materials. Semiconductors have benefited from X-ray scattering techniques as an essential feedback method for crystal growth, including compositional and thickness determination of thin layers.

This book provides a thorough description of the techniques involved in obtaining that information, including X-ray diffractometers and their associated instrument functions, data collection methods, and the simulation of the diffraction patterns observed. Also presented are examples and procedures for interpreting the data to build a picture of the sample, much of which will be common to materials other than semiconductors.

Readership: Postgraduates and researchers in semiconductors, materials science and crystallography.

304pp **Oct 2000**
978-1-86094-159-7 **US\$74** **£55**

BETA BEAMS

Neutrino Beams

With a Foreword by Piero Zucchelli and a Contribution on Low Energy Beta Beams by Cristina Volpe

by **Mats Lindroos** (*CERN, Switzerland*) & **Mauro Mezzetto** (*INFN, Sezione di Padova, Italy*)

The beta-beam concept for the generation of electron neutrino beams was first proposed by Piero Zucchelli in 2002. The concept initially struggled to make an impact but the hard work by many machine physicists, phenomenologists and theoreticians over the last five years has won the beta-beam a well-earned position as one of the frontrunners for a possible future world laboratory for high intensity neutrino oscillation physics. This is the first complete monograph on the beta-beam concept.

Contents: Foreword by Piero Zucchelli; Machine Aspects; CERN-Fréjus Beta Beam Physics Potential; Physics Potential of Other Beta Beam Settings; Low-Energy Beta-Beams by Cristina Volpe.

Readership: Academics, researchers, and research policy makers in the field of high energy physics and particle physics.

168pp **Jul 2009**
978-1-84816-377-5 **US\$78** **£59**

FEMTOSECOND BEAM SCIENCE

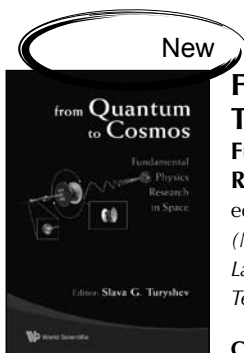
edited by **Mitsuru Uesaka** (*University of Tokyo, Japan*)

This book explores recent developments and advances in femtosecond beam science, making these more accessible through contributions from leaders in the field. Each contribution aims to make the particular area of femtosecond beam science accessible through explaining the particular field, reviewing recent advances worldwide, and featuring important results and possible future uses of femtosecond pulses in the field.

Femtosecond beam science is expected to lead to the development of technology realizing dynamic microscopy, that is, the visualization of atomic motions, chemical reactions, protein dynamics and other microscopic dynamics. Advances have enabled the visualizations of phonons, thermal expansion and shock-wave propagation by advanced time-resolved X-ray diffraction, at a time resolution of 10 picoseconds. These achievements will extend to the development of femtosecond X-ray sources and fourth generation synchrotron light sources. Dynamic microscopy promises to be one of the most important issues in dynamic nanotechnology in the future. As a result, the overview of femtosecond beam science provided by this book will be useful.

Readership: Researchers, engineers, technicians, graduate students and postdoctoral researchers.

440pp **Aug 2005**
978-1-86094-343-0 **US\$157** **£87**



New

FROM QUANTUM TO COSMOS

Fundamental Physics Research in Space

edited by **Slava G Turyshev**

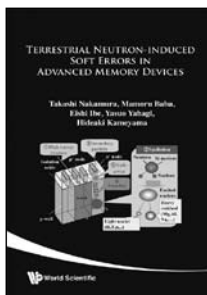
(NASA Jet Propulsion Laboratory, California Institute of Technology, USA)

Contents: *Policy:* Space-based Research in Fundamental Physics

and Quantum Technologies (*S G Turyshev et al.*); Space-based Science and the American Competitiveness Initiative (*J H Marburger III*); *Gravitational Theory:* Observable Consequences of Strong Coupling in Theories with Large Distance Modified Gravity (*G Dvali*); Theory and Phenomenology of DGP Gravity (*C Deffayet*); *Gravitational Experiment:* Apollo: A New Push in Lunar Laser Ranging (*T W Murphy Jr et al.*); Asynchronous Laser Transponders: A New Tool for Improved Fundamental Physics Experiments (*J J Degnan*); *Physics Beyond the Standard Model:* Detecting Sterile Dark Matter in Space (*A Kusenko*); Electron Electric Dipole Moment Experiment with Slow Atoms (*H Gould*); *Atoms and Clocks:* New Forms of Quantum Matter Near Absolute Zero Temperature (*W Ketterle*); Atomic Quantum Sensors in Space (*T van Zoest et al.*); *Cosmology and Dark Energy:* Dark Energy Task Force: Findings and Recommendations (*R N Cahn*); CMB Polarization: The Next Decade (*B Winstein*); and other papers.

Readership: Academics, researchers, physicists, technologists and policy makers in the field of space science.

764pp May 2009
978-981-4261-20-3 US\$142 £107



TERRESTRIAL NEUTRON-INDUCED SOFT ERRORS IN ADVANCED MEMORY DEVICES

by **Takashi Nakamura, Mamoru Baba** (Tohoku University, Japan), **Eishi Ibe, Yasuo Yahagi** (Hitachi Ltd., Japan) &

Hideaki Kameyama (Renesas Technology Corporation, Japan)

This book covers the relevant up-to-date topics in terrestrial neutron-induced soft errors, and aims to provide succinct knowledge on neutron-induced soft errors to the readers by presenting several valuable and unique features.

Contents: Terrestrial Neutron Spectrometry and Dosimetry; Irradiation Testing in the Terrestrial Field; Neutron Irradiation Test Facilities; Review and Discussion of Experimental Data; Monte Carlo Simulation Methods; Simulation Results and Their Implications; International Standardization of the Neutron Test Method; Summary and Challenges.

Readership: Students and researchers in the field of radiation effects/nuclear and accelerator physics/cosmic ray physics, engineers involved in reliability design/quality assurance of semiconductor devices and IT systems.

368pp Apr 2008
978-981-277-881-9 US\$104 £64

NEAR-FIELD MICROSCOPY AND NEAR-FIELD OPTICS

by **Daniel Courjon** (Université de Franche-Comté, France)

This textbook consists of 12 chapters dealing with the history of near-field optics, non-radiating optics, optical noise, inverse problems, theory, instrumentation and applications; there is an appendix including the basic elements of Fourier optics and Maxwell equations.

Contents: History of Near-field Optics; Non-radiating Sources and Non-propagating Fields; Evanescent Optics; Theories and Modellings; Inverse Problem and Apparatus Function; Criteria of Quality, Noise and Artifacts; Nano-collectors and Nano-emitters; Instrumentation; Main Near-field Microscope Configurations; Near-field Image Processing; Applications of Near-field Microscopy; **Appendix A:** Basis of Optics.

Readership: Optical researchers and engineers, as well as graduates keen on peculiar optical phenomena.

340pp Mar 2003
978-1-86094-258-7 US\$84 £67

ENERGY AND MASS IN RELATIVITY THEORY

by **Lev B Okun** (A I Alikhanov Institute of Theoretical and Experimental Physics, Moscow, Russia)

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 , velocity \mathbf{v} of particles of matter, including massless photons for which $v = c$. Other related subjects are also discussed.

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.

Contents: On the Photon Mass; The Concept of Mass; Vacua, Vacuum: Physics of Nothing; Gravitation, Photons, Clocks; Photons and Static Gravity; Dialogue on the Number of Fundamental Constants; Fundamental Units: Physics and Metrology; Photons: History, Mass, Charge; The Impact of the Sakata Model; The Theory of Relativity and the Pythagorean Theorem; and other papers.

Readership: Researchers, academics and students in physics, history and philosophy of science.

324pp Mar 2009
978-981-281-411-1 US\$90 £53

Advanced Series on Theoretical Physical Science – Vol. 7

EINSTEIN'S RELATIVITY AND BEYOND New Symmetry Approaches

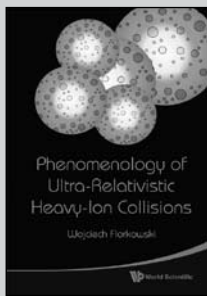
by **Jong-Ping Hsu** (University of Massachusetts, Dartmouth)

The purposes of this book are (1) to explore and expound relativity physics and four-dimensional symmetry from the logically simplest viewpoint by making one single postulate instead of two; and (2) to indicate the simplest generalization of the Lorentz transformation in order to cope with frames with constant linear accelerations.

The fundamentally new ideas of the first purpose are developed on the basis of the term paper of a Harvard physics undergraduate. They lead to an unexpected affirmative answer to the long-standing question of whether it is possible to construct a relativity theory without postulating the constancy of the speed of light and retaining only the first postulate of special relativity. It substantiates the view and sheds light on the understanding that the four-dimensional symmetry framework can accommodate many different concepts of physical time, including common time and Reichenbach's general concept of time. This logically simplest viewpoint of relativity allows a natural extension of the physics of particles and fields from inertial frames to noninertial frames in which the speed of light is not constant. New predictions in physics resulting from this new viewpoint are discussed.

Readership: Theoretical, high-energy and experimental physicists.

440pp Jul 2000
978-981-02-3888-9 US\$66 £48



PHENOMENOLOGY OF ULTRA-RELATIVISTIC HEAVY-ION COLLISIONS

by **Wojciech Florkowski** (*Jan Kochanowski University, Poland and Polish Academy of Sciences, Poland*)

This book outlines the links between basic theoretical concepts (discussed gradually from the elementary to more advanced level) and the results of experiments, so that experimentalists may learn more about the foundations of the models used to fit and interpret the data, while theoreticians may learn more about how different theoretical ideas are used in practical applications. The book collects the available information and establishes a uniform picture of ultra-relativistic heavy-ion collisions. The properties of hot and dense matter implied by this picture are discussed comprehensively. In particular, the issues concerning the formation of the quark–gluon plasma in present and future heavy-ion experiments are addressed.

Readership: graduates, academics and researchers working in the field of relativistic heavy-ion collisions and/or high energy physics.

400pp (approx.) **Summer 2010**
978-981-4280-66-2 **US\$85** **£64**



SHORT PULSE LASER INTERACTIONS WITH MATTER

An Introduction

by **Paul Gibbon** (*Research Centre Jülich, Germany*)

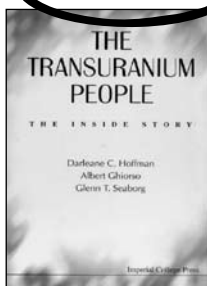
This book represents the first comprehensive treatment of the subject, covering the theoretical principles, present experimental status and important applications of short-pulse laser-matter interactions.

Contents: Introduction: Historical Background; Interaction with Single Atoms; Interaction with Single Electrons; Laser Propagation in Underdense Plasmas; Interaction with Solids: Overdense Plasmas; Numerical Simulation of Short Pulse Laser Interactions; Applications of Short-Pulse Laser-Matter Interactions.

Readership: Advanced undergraduates, graduates, researchers and non-specialist scientists using femtosecond lasers in science and industry.

328pp **Sept 2005**
978-1-86094-135-1 **US\$52** **£33**

Bestseller



THE TRANSURANIUM PEOPLE

The Inside Story

by **Darleane C Hoffman, Albert Ghiorso & Glenn T Seaborg** (*University of California, Berkeley & Lawrence Berkeley National Laboratory*)

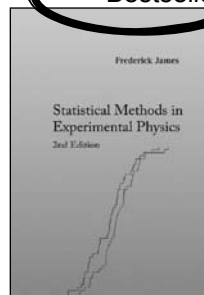
In this highly interesting book, three pioneering investigators provide an account of the discovery and investigation of the nuclear and chemical properties of the twenty presently known transuranium elements. The neutron irradiation of uranium led to the discovery of

nuclear fission in 1938 and then to the first transuranium element, neptunium (atomic number 93), in 1940. Plutonium (94) quickly followed and the next nine elements completed the actinide series by 1961. Investigation of the chemical properties of the actinides was followed more recently by chemical studies of the first three transactinides — rutherfordium (104), hahnium (105), and seaborgium (106). Recent discoveries have extended the known elements to 112.

Readership: Undergraduates and graduates in nuclear physics, radiochemistry and the general readers.

564pp **Jan 2000**
978-1-86094-087-3 **US\$120** **£89**

Bestseller



STATISTICAL METHODS IN EXPERIMENTAL PHYSICS

(2nd Edition)

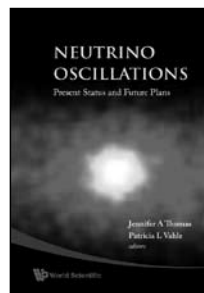
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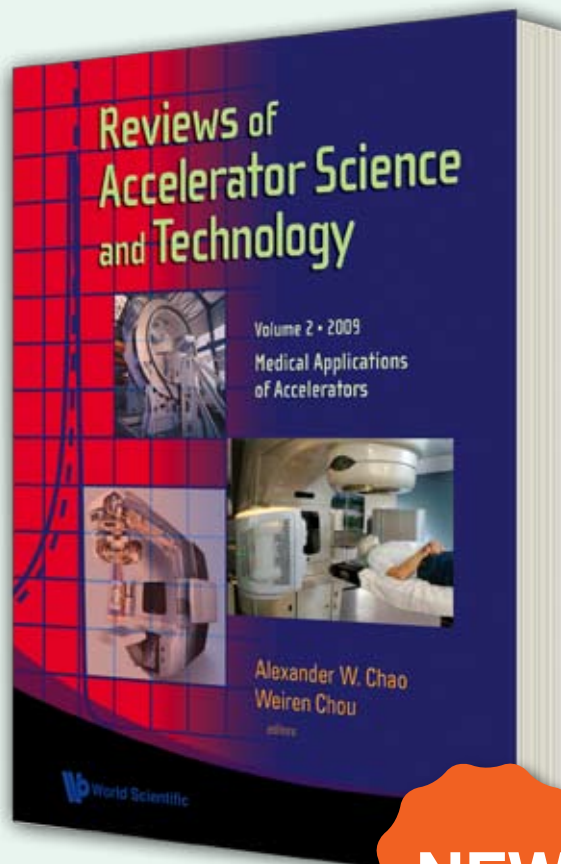
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