

The Art Of Experimental Physics

Publisher Description

Excerpt from Laboratory Manual of Experimental Physics: A Brief Course of Quantitative Experiments Intended for Beginners The value of illustrative experiment is not denied, but it is claimed that vastly greater mental discipline will be derived by the student from. Quantitative experiment, and therefore that it is wiser to confine the illustrative experiments to the lecture table, and to use the limited time which can be spared for laboratory work. 011 those experiments which will yield the richest returns. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Excerpt from Experimental Science, Vol. 2: Elementary, Practical and Experimental Physics The Weston arc lamp is shown in pet's. Pective in Fig. 506 and in detail in Figs. 507, 508 and 509. In this lamp the arc is some. What less than one thirty-second of an inch in length. As compared with most other systems it is extremely short. The arc in the Brush system is nearly one eighth of an inch. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Excerpt from Principles of Experimental Physics for Students of Science and Technology Considerable space has been given to an introduction in which is discussed several general principles relating to experimental work; here also an attempt has been made to formulate some rules relating to the use of doubtful and significant figures in computations, to the end that the reliability of a result obtained through any of the four operations will be approximately expressed by the number of figures retained therein according to these rules. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Elementary, Practical and Experimental Physics

Discovering the Natural Laws

A Practical Guide to Data Analysis for Physical Science Students

The Experimental Foundations of Particle Physics

Apple Experiment Number Six to Accompany the Art Of Experimental Physics

Elementary Section (Classic Reprint)

This book introduces the reader to the field of jet substructure, starting from the basic considerations for capturing decays of boosted particles in individual jets, to explaining state-of-the-art techniques. Jet substructure methods have become ubiquitous in data analyses at the LHC, with diverse applications stemming from the abundance of jets in proton-proton collisions, the presence of pileup and multiple interactions, and the need to reconstruct and identify decays of highly-Lorentz boosted particles. The last decade has seen a vast increase in our knowledge of all aspects of the field, with a proliferation of new jet substructure algorithms, calculations and measurements which are presented in this book. Recent developments and algorithms are described and put into the larger experimental context. Their usefulness and application are shown in many demonstrative examples and the phenomenological and experimental effects influencing their performance are discussed. A comprehensive overview is given of measurements and searches for new phenomena performed by the ATLAS and CMS Collaborations. This book shows the impressive versatility of jet substructure methods at the LHC.

Accessible, nonmathematical introduction to theory, experiments underlying laws of gravitation, motion, conservation of energy, electromagnetism, relativity, more. New epilogue. Bibliography.

Fills the need for an experimental physics text. There are three main sections of the text. The first is an introduction that offers valuable insights into the importance of the human element in physics and traces the course of its historical development. This section also explains the objectives of the physics laboratory and the skills you must master to maintain a "Notebook" and analyze data, and presents a general discussion of spectroscopy experiments. The second section discusses the unique and valuable role of the computer in the laboratory and explains how to use it: software is included with the text. The final section contains over twenty experiments, providing students with a broad introduction into the use of a variety of instruments for carrying out many different measurements.

This practical book provides recipes for the construction of devices used in low temperature experimentation. It emphasizes what works, rather than what might be the optimum method, and lists current sources for purchasing components and equipment.

Physics Experiments for Children

Reprinted from Laboratory Manual of Physics for Art Students

Methods of Experimental Physics

Experimental Science, Vol. 2

Elementary Course in Experimental Physics (Classic Reprint)

Manual of Experimental Physics for Secondary Schools

Excerpt from A Laboratory Course in Experimental Physics A short appendix is given on the methods of determining the value of Gravity and on the use of the Torsion Pendulum. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Based on author's thesis (Ph. D., University of Victoria, 2010).

A unique presentation of our current understanding of particle physics for researchers, advanced undergraduate and graduate students.

Understanding, designing and conducting experiments is at the heart of science. This text introduces the fundamental principles on which physicists should build a thorough experimental approach to their discipline.

Michelson-morley Experiments: An Enigma For Physics And The History Of Science

Metaphysical Experiments

Experimental Physics a Text-Book of Mechanics, Heat, Sound and Light

Landmark Experiments in Twentieth-Century Physics

Experimental Physics

Algorithms, Measurements and Searches for New Physical Phenomena

Excerpt from Recent Physical Research: An Account of Some Recent Contributions to Experimental Physics The present-day student of Physics soon becomes aware of the fact- that important, contributions have been added to this branch of knowledge in recent years, which are barely if at all referred to in general treatises. The text-book, even when fresh from the press, is, perhaps necessarily, several years behind the wave-front of advancing knowledge. Attention is liable to be especially long withheld in the case of work done outside one's own country. An attempt is here made to give a connected description of the ground covered and of the. paths of advance in some of the recently acquired provinces of Physics. The book is based on a series of bi-monthly articles, under the same title, which appeared in "The Electrician" in 1910 and onwards. The author desires to express his thanks to the Editor and to the Publisher for placing the text of the articles and the blocks used for the illustrations at his disposal. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

A textbook for undergraduates carrying out laboratory experiments in the physical sciences. The author's aim is to make practical classes more enjoyable.

This book on the use of Arduino and Smartphones in physics experiments, with a focus on mechanics, introduces various techniques by way of examples. The main aim is to teach students how to take meaningful measurements and how to interpret them. Each topic is introduced by an experiment. Those at the beginning of the book are rather simple to build and analyze. As the lessons proceed, the experiments become more refined and new techniques are introduced. Rather than providing recipes to be adopted while taking measurements, the need for new concepts is raised by observing the results of an experiment. A formal justification is given only after a concept has been introduced experimentally. The discussion extends beyond the taking of measurements to their meaning in terms of physics, the importance of what is learned from the laws that are derived, and their limits. Stress is placed on the importance of careful design of experiments as to reduce systematic errors and on good practices to avoid common mistakes. Data are always analyzed using computer software. C-like structures are introduced in teaching how to program Arduino, while data collection and analysis is done using Python. Several methods of graphical representation of data are used.

*Excerpt from Introduction to Experimental Physics, Theoretical and Practical: Including Directions for Constructing Physical Apparatus and for Making Experiments*Everyone who has tried to teach elementary Physics must have become aware of the great difficulty which the subject presents to the majority of pupils. This difficulty is of a twofold kind, and arises partly from the nature of the facts with which the science deals, and partly from the nature of the reasoning, whereby the general laws of physics are established. A large proportion of the facts are such as either do not fall within common experience at all, or do so only under such complex conditions that their true nature is not easily recognised and moreover the kind of knowledge which is required in physics, is much more accurate and precise than that with which we are accustomed to be satisfied in relation to matters of ordinary life. Hence, in beginning the study of physics, we are obliged, not only to learn a large number of new facts, but also to adopt new habits of learning; while we have, at the same time, to accustom ourselves to attach accurately defined meanings to the terms employed in discussing physical phenomena, and to reason about them with>About the PublisherForgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.comThis book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Great Experiments in Physics

Recent Physical Research

An Annotated List of Experiments in Physics Used at the University of Cincinnati in the Courses in Experimental Physics Designed for Sophomore Students of the Academic and Engineering Colleges (Classic Reprint)

Physics Experiments with Arduino and Smartphones

Advances in Jet Substructure at the LHC

An Introduction to Experimental Physics

Engages with the impact of modern technology on experimental physicists. This study reveals how the increasing scale and complexity of apparatus has distanced physicists from the very science which drew them into experimenting, and has fragmented microphysics into different technical traditions.

Based on the modern approach of information theory, this book presents novel experimental techniques, tools, and data processing methods for physics applications. It shows readers how to plan and conduct experiments, design and certify measuring equipment, and process and interpret the experimental data. Drawing on his extensive experience in experimental research, the author discusses the theory of systems for measuring and recording data, the equipment and methods used for studying fast processes, the basic methods of experimental physics, and the methods for interpretation and data processing. Bringing together approaches that have previously been scattered in the literature, the book covers high-speed photography, Fourier optics, spectroscopy, interferometry, holography, electromagnetic waves, X-rays, and corpuscular investigation.

Excerpt from First Year Course in Experimental Physics: Elementary Section The purposes of a course in experimental physics are in general to familiarize students with the construction and operation of physical instruments and apparatus, to teach them the methods of determining physical constants, to train them to make accurate observations and to record the latter in a satisfactory manner. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

This textbook provides the knowledge and skills needed for thorough understanding of the most important methods and ways of thinking in experimental physics. The reader learns to design, assemble, and debug apparatus, to use it to take meaningful data, and to think carefully about the story told by the data. Key Features: Efficiently helps students grow into independent experimentalists through a combination of structured yet thought-provoking and challenging exercises, student-designed experiments, and guided but open-ended exploration. Provides solid coverage of fundamental background information, explained clearly for undergraduates, such as ground loops, optical alignment techniques, scientific communication, and data acquisition using LabVIEW, Python, or Arduino. Features carefully designed lab experiences to teach fundamentals, including analog electronics and low noise measurements, digital electronics, microcontrollers, FPGAs, computer interfacing, optics, vacuum techniques, and particle detection methods. Offers a broad range of advanced experiments for each major area of physics, from condensed matter to particle physics. Also provides clear guidance for student development of projects not included here. Provides a detailed Instructor's Manual for every lab, so that the instructor can confidently teach labs outside their own research area.

Vacuum Physics and Technology

Elementary, Practical and Experimental Physics (Classic Reprint)

Practical Physics

Including Directions for Constructing Physical Apparatus and for Making Experiments (Classic Reprint)

A Material Culture of Microphysics

Statistical Methods in Experimental Physics

Excerpt from An Annotated List of Experiments in Physics Used at the University of Cincinnati in the Courses in Experimental Physics Designed for Sophomore Students of the Academic and Engineering Colleges This is not intended to be a course in Experimental Physics, but, as its title implies, merely an annotated list of some 270 experiments, any one of which might be profitably performed by a sophomore student in college. As a rule no attempt has been made to describe the experiment, but a reference has been given to a full description of it in a standard manual or text book. In the references, for the sake of brevity, the name of the author has been given without the title of the work. Below, therefore, is a list of the books referred to with their publishers: Ames and Bliss, Experiments in Physics, Harper Brothers, 1898. Barker, Physics, second edition, Henry Holt Co. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

The Art of Experimental Physics|John Wiley & Sons Incorporated

The first edition of this classic book has become the authoritative reference for physicists desiring to master the finer points of statistical data analysis. This second edition contains all the important material of the first, much of it unavailable from any other sources. In addition, many chapters have been updated with considerable new material, especially in areas concerning the theory and practice of confidence intervals, including the important Feldman-Cousins method. Both frequentist and Bayesian methodologies are presented, with a strong emphasis on techniques useful to physicists and other scientists in the interpretation of experimental data and comparison with scientific theories. This is a valuable textbook for advanced graduate students in the physical sciences as well as a reference for active researchers.

Excerpt from Elementary Course in Experimental Physics Because the laboratory period has been reduced from three to two hours, some of the exercises have been shortened. The details of a considerable number of exercises differ from those of previous texts, and many of the experiments have been entirely rewritten, although treating in general of the same principles as heretofore, with a few exceptions. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Principles of Experimental Physics for Students of Science and Technology (Classic Reprint)

Introduction to Experimental Physics, Theoretical and Practical

Firsthand Accounts from Galileo to Einstein

A Laboratory Course in Experimental Physics (Classic Reprint)

Modern Methods

First Year Course in Experimental Physics

Clear, detailed explorations feature extensive quotations from original research papers in their coverage of groundbreaking research. Topics include x-rays, superconductivity, neutrinos, lasers, and many other subjects. 120 illustrations. 1975 edition.

Over 100 projects demonstrate composition of objects, how substances are affected by various forms of energy — heat, light, sound, electricity, etc. Over 100 illustrations.

Excerpt from Manual of Experimental Physics for Secondary Schools This book originated three years ago in the necessity for a thorough revision of the laboratory manual then in use in the Chicago High Schools. About a year ago the undersigned, who up to that time had done most of the work of revision, were requested by the Physics teachers to prepare it for publication. The policy of the Chicago Physics teachers has been for several years to make the laboratory work inductive as far as possible. This book is written from this point of view. The pupil is told very little that he can find out for himself by a reasonable amount of work, in the course of his experiments. The authors are not to be can, unaided, rediscover the laws of Physics, but they know that, if sufficiently careful directions are given to pupils for the performance of experiments, and definite instruction is given them as to the manner of studying results many of nature's great laws will be learned first-hand. And these will be much more strongly impressed than when learned from a teacher's experiments. The experiments have been carefully selected with a view of developing some principle of Physics as well as of training the intellectual faculties. They are mainly quantitative, though some are qualitative, since qualitative experiments performed by the pupil himself will frequently appeal to him in a way that is absolute. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Excerpt from Experimental Science, Vol. 2: Elementary, Practical and Experimental Physics The design of this work is to afford to the student, the artisan, the mechanic, and in fact all who are interested in science, whether young or advanced in years, a ready means of acquiring a general knowledge of physics by the experimental method. Care is taken to furnish to the teacher suggestions in experimentation, which will be helpful in making classroom work interesting and attractive, rather than dry and monotonous. Most of the apparatus here illustrated and described may be constructed and used by any one having ordinary mechanical skill. Simple and easily made devices have been chosen, with an exception the experiments described were performed at the time of writing, to insure fullness of detail, and to avoid inaccuracies. The reader can therefore be assured, by following the instructions, success will be certain. Mathematics has been almost entirely excluded. The few problems presented are capable of arithmetical solution. The few experiments in all branches of science is fully recognized, but the majority of students have little taste for the intricacies of numbers. Faraday was an illustrious example of a scientific man without great mathematical proclivities. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections that remain are intentionally left to preserve the state of such historical works.

Physics and the Invention of the Universe

A Laboratory Course in Experimental Physics

The Art of Experimental Physics

Introduction to Experimental Particle Physics

An Account of Some Recent Contributions to Experimental Physics

Excerpt from Experimental Physics a Text-Book of Mechanics, Heat, Sound and Light This book is intended as a text-book for use in connection with a course of experimental lectures on mechanics, properties of matter, heat, sound and light. No previous knowledge of physics is assumed, but nevertheless the book is primarily intended for a first year college course, and the majority of the students attending such a course have studied elementary physics at school. The writing of such a book does not offer much scope for originality; the aim of the writer should be to present fundamental principles clearly and accurately. The chief difficulty is to decide what to include and what to leave out. I have endeavoured to leave out everything not of fundamental importance. It is important for the student to learn some facts and to get to understand some methods and fundamental principles; if he learns nothing about certain phenomena no harm is done and he can make up the deficiency in his knowledge at a later date if necessary. The kind of text-book which contains a little about everything does more harm than good. Care has been taken not to discuss questions which cannot be treated adequately in an elementary way and to avoid stating formulae without proving them. A few experiments are rather fully described in nearly every chapter; these have been selected from the many which might have been merely mentioned. In Part I, Chapters VI, VII and parts of IX may be omitted at the first reading. In Part II, Chapters X and XI may also be omitted by students whose time is limited. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Excerpt from Experimental Physics This book is the result of an experience of nearly ten years in teaching Experimental Physics to classes consisting of students who were preparing for college and of students who were not preparing for college. Most of the experiments are quantitative, some are qualitative. Qualitative experiments serve to stimulate the interest of the student, and to prepare his mind for a better understanding of quantitative experiments. A beginner in Physics should know something about that which he is expected to measure before he attempts to measure it. This knowledge is readily acquired from qualitative experiments. To show the aim of the work, I have put at the beginning of each experiment a concise statement, not of the result, but of the object of the experiment; and at the end of each experiment, questions for the purpose of helping the student unfold the result of the experiment from his record. The general results of the experiments are enforced by numerous examples, many of which have been drawn from Harvard Examination Papers. The experiments are often stepping-stones, each to the next. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Starting with Galileo's experiments with motion, this study of 25 crucial discoveries includes Newton's laws of motion, Chadwick's study of the neutron, Hertz on electromagnetic waves, and more.

Vacuum Physics and Technology

Experimental Techniques In Condensed Matter Physics At Low Temperatures

Experimental Physics (Classic Reprint)

Principles and Practice for the Laboratory

The Experimental Basis of Physics

Image and Logic

Ibm Experiment Number Six to Accompany the Art of Experimental Physics

This book brings together the most important topics in experimental particle physics over the past forty years to give a brief but balanced overview of the subject. The author begins by reviewing particle physics and discussing electromagnetic and nuclear interactions. He then goes on to discuss three nearly universal aspects of particle physics experiments: beams, targets, and fast electronics. The second part of the book treats in detail the properties of various types of particle detector, such as scintillation counters, Cerenkov counters, proportional chambers, drift chambers, sampling calorimeters, and specialized detectors. Wherever possible the author attempts to enumerate the advantages and disadvantages of performance. Finally, he discusses aspects of specific experiments, such as properties of triggers, types of measurement, spectrometers, and the integration of detectors into coherent systems. Throughout the book, each chapter begins with a discussion of the basic principles involved, followed by selective examples.

Excerpt from A Laboratory Course in Experimental Physics At the present day, when students are required to gain knowledge of natural phenomena by performing experiments for themselves in laboratories, every teacher finds that as his classes increase in number, some difficulty is experienced in providing, during a limited time, ample instruction in the matter of details and methods. During the past few years we ourselves have had such difficulties with large classes; and that is our reason for the appearance of the present work, which is the natural outcome of our experience. We know that it will be of service to our own students, and hope that it will be appreciated by those engaged in teaching Experimental Physics elsewhere. The book contains a series of elementary experiments specially adapted for students who have had but little acquaintance with higher mathematical methods: these are arranged as far as possible in order of difficulty. There is also an advanced course of experimental work in Acoustics, Heat, and Electricity and Magnetism, which is intended for those who have taken the elementary course. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

This up-to-date volume provides an essential part of undergraduate physics training. Until now, students were often expected to learn many experimental methods in the laboratory without proper introduction. The broad coverage of available techniques includes discussion of state-of-the-art electronic equipment, as well as such topics as discrete semi-conductor devices, signal instrumentation, and X-ray diffraction methods. Professor Dunlap's text will serve not only as a complete introduction for students but also as a reference work for technicians throughout a professional career. In addition to tutorial discussion presented, tables of numerical data and constants are included, further enhancing the book as a permanent reference. "The book should be an interesting read for advanced students within the field and for experts working in it."Contemporary PhysicsIn 1887, Michelson and Morley tried to observe in laboratory the 'ether drift' by measuring a small difference in the velocity of two perpendicular light beams. The result of their measurements, however, was much smaller than the classical prediction and interpreted as a 'null result'. This was crucial to stimulate the first pioneering formulations of relativity and, as such, it represents a fundamental step in the history of science. Since then, many repetitions of that original experiment have been performed with better and better sensitivity and the standard conclusion has been always the same: no genuine ether drift has ever been detected. However, in the authors' new scheme, the small irregular residuals observed in laboratory show surprising correlations with the direct observations of the Cosmic Microwave Background (CMB) with satellites in space. This opens the possibility of finally linking the CMB to a fundamental reference frame for relativity, with substantial implications for the interpretation of non-locality in the quantum theory. The importance of the issue would require new dedicated experimental tests and significant improvements in the data analysis. Otherwise, without such more stringent checks, these crucial experiments will remain forever as an enigma for physics and the history of science. The book illustrates the many facets of this research together with historical accounts on some leading scientists involved in these measurements.

Procedures in experimental physics

Guide for Experimental Physics

Laboratory Manual of Experimental Physics

A Brief Course of Quantitative Experiments Intended for Beginners (Classic Reprint)