

Forces In Physics A Historical Perspective

A History of Physics over the Last Two Centuries A History of Classical Physics International Handbook of Research in History, Philosophy and Science Teaching The History of Physics Philosophical Concepts in Physics Identity in Physics Manuscripts and documents on the history of physics. A historical materialist textbook The Extension of Man A Cultural History of Physics A History of the Ideas of Theoretical Physics The Oxford Handbook of the History of Physics From Clockwork to Crapshoot Resources for the History of Physics Program Seduced by Radium History of physics in its elementary branches, including the evolution A History of Physics in Its Elementary Branches Historical Studies in the Physical Sciences, Volume 7 American Journal of Physics Mario Gliozzi J. D. Bernal Michael R. Matthews J. L. Heilbron James T. Cushing Steven French Boris Hessen J. D. Bernal Károly Simonyi S. D'Agostino Jed Z. Buchwald Roger G Newton Stephen G. Brush Bryn Mawr College Maria Rentetzi Florian Cajori Florian Cajori Russell McCormmach

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the book tells the fascinating story of physics starting from the 19th century from the wave theory of light thermodynamics and electromagnetism up to the discoveries of the 20th century it investigates the frequently contrasting ideas and the raging arguments that led to our current understanding of the physical world from the theory of relativity to quantum mechanics

this inaugural handbook documents the distinctive research field that utilizes history and philosophy in investigation of theoretical curricular and pedagogical issues in the teaching of science and mathematics it is contributed to by 130

researchers from 30 countries it provides a logically structured fully referenced guide to the ways in which science and mathematics education is informed by the history and philosophy of these disciplines as well as by the philosophy of education more generally the first handbook to cover the field it lays down a much needed marker of progress to date and provides a platform for informed and coherent future analysis and research of the subject the publication comes at a time of heightened worldwide concern over the standard of science and mathematics education attended by fierce debate over how best to reform curricula and enliven student engagement in the subjects there is a growing recognition among educators and policy makers that the learning of science must dovetail with learning about science this handbook is uniquely positioned as a locus for the discussion the handbook features sections on pedagogical theoretical national and biographical research setting the literature of each tradition in its historical context it reminds readers at a crucial juncture that there has been a long and rich tradition of historical and philosophical engagements with science and mathematics teaching and that lessons can be learnt from these engagements for the resolution of current theoretical curricular and pedagogical questions that face teachers and administrators science educators will be grateful for this unique encyclopaedic handbook gerald holton physics department harvard university this handbook gathers the fruits of over thirty years research by a growing international and cosmopolitan community fabio bevilacqua physics department university of pavia

how does the physics we know today a highly professionalised enterprise inextricably linked to government and industry link back to its origins as a liberal art in ancient greece what is the path that leads from the old philosophy of nature and its concern with humankind's place in the universe to modern massive international projects that hunt down fundamental particles and industrial laboratories that manufacture marvels this very short introduction introduces us to islamic astronomers and mathematicians calculating the size of the earth whilst their caliphs conquered much of it to medieval scholar theologians investigating light to galileo copernicus kepler and newton measuring and trying to explain the universe we visit the house of wisdom in 9th century baghdad europe's first universities the courts of the renaissance the scientific revolution and the academies of the 18th century and the increasingly specialised world of 20th and 21st century science highlighting the shifting relationship between physics philosophy mathematics and technology and the implications for humankind's self understanding heilbron explores the changing place and purpose of physics in the cultures and societies that have nurtured it over the centuries about the series the very short introductions series from oxford university press contains hundreds of titles in almost every subject area these pocket sized books are the perfect way to get ahead in a new subject quickly our expert authors combine facts analysis perspective new ideas and enthusiasm to make interesting and challenging topics highly readable

this book examines a selection of philosophical issues in the context of specific episodes in the development of physical theories and presents scientific advances within their historical and philosophical contexts philosophical considerations have played an essential and ineliminable role in the actual practice of science the book begins with some necessary introduction to the history of ancient and early modern science but emphasizes the two great watersheds of twentieth century physics relativity and quantum mechanics at times the term construction may seem more appropriate than discovery for the way theories have developed and especially in later chapters the discussion focuses on the influence of historical philosophical and even social factors on the form and content of scientific theories

can quantum particles be regarded as individuals just like books tables and people according to the received view articulated by several physicists in the immediate aftermath of the quantum revolution quantum physics itself tells us they cannot quantum particles unlike their classical counterparts must be regarded as non individuals in some sense however recent work has indicated that this is not the whole story and that the theory is also consistent with the position that such particles can be taken to be individuals albeit at a metaphysical price drawing on philosophical accounts of identity and individuality as well as the histories of both classical and quantum physics the authors explore these two alternative metaphysical packages in particular they argue that if quantum particles are regarded as individuals then leibniz s famous principle of the identity of indiscernibles is in fact violated recent discussions of this conclusion are analysed in detail and again the costs involved in saving the principle are carefully considered taking the alternative package the authors deploy recent work in non standard logic and set theory to indicate how we can make sense of the idea that objects can be non individuals the concluding chapter suggests how these results might then be extended to quantum field theory identity in physics brings together a range of work in this area and further develops the authors own contributions to the debate uniquely as the title indicates it situates this work in the appropriate formal historical and philosophical contexts

a history of physics up to the end of the classical era at the end of the 19th century just before the discoveries of the subatom and relativity were made

while the physical sciences are a continuously evolving source of technology and of understanding about our world they have become so specialized and rely on so much prerequisite knowledge that for many people today the divide between the sciences and the humanities seems even greater than it was when c p snow delivered his famous 1959 lecture the two cultures in a cultural history of physics hungarian scientist and educator károly simonyi succeeds in bridging this chasm by describing the experimental methods and theoretical interpretations that created scientific knowledge from ancient times to the present day within the cultural

environment in which it was formed unlike any other work of its kind simonyi's seminal opus explores the interplay of science and the humanities to convey the wonder and excitement of scientific development throughout the ages these pages contain an abundance of excerpts from original resources a wide array of clear and straightforward explanations and an astonishing wealth of insight revealing the historical progress of science and inviting readers into a dialogue with the great scientific minds that shaped our current understanding of physics beautifully illustrated accurate in its scientific content and broad in its historical and cultural perspective this book will be a valuable reference for scholars and an inspiration to aspiring scientists and humanists who believe that science is an integral part of our culture

this book presents a perspective on the history of theoretical physics over the past two hundreds years it comprises essays on the history of pre maxwellian electrodynamics of maxwell's and hertz's field theories and of the present century's relativity and quantum physics a common thread across the essays is the search for and the exploration of themes that influenced significant conceptual changes in the great movement of ideas and experiments which heralded the emergence of theoretical physics hereafter tp the fundamental change involved the recognition of the scientific validity of theoretical physics in the second half of the nine teenth century it was not easy for many physicists to understand the nature and scope of theoretical physics and of its adept the theoretical physicist a physicist like ludwig boltzmann one of the eminent contributors to the new discipline confessed in 1895 that even the formulation of this concept of a theoretical physicist is not entirely without difficulty 1 although science had always been divided into theory and experiment it was only in physics that theoretical work developed into a major research and teaching specialty in its own right 2 it is true that theoretical physics was mainly a creation of tum of the century german physics where it received full institutional recognition but it is also undeniable that outstanding physicists in other european countries namely ampere fourier and maxwell also had an important part in its creation

this oxford handbook brings together contributions by leading authorities on key areas of the history of physics since the seventeenth century in a single volume it offers a comprehensive introduction to scholarly contributions that have tended to be dispersed in journals and books not easily accessible to the student or general reader

in from clockwork to crapshoot roger newton whose previous works have been widely praised for erudition and accessibility presents a history of physics from the early beginning to our day with the associated mathematics astronomy and chemistry his work identifies what may well be the defining characteristic of physics in the twenty first century

the discovery of radium by marie and pierre curie in 1898 eventually led to a craze for radium products in the 1920s until their widespread use proved lethal for consumers patients and medical practitioners alike radium infiltrated american culture maria rentetzi reveals not only because of its potential to treat cancer but because it was transformed from a scientific object into a familiar desirable commodity she explores how standard chemical company in canonsburg pennsylvania the first successful commercial producer of radium in the united states aggressively promoted the benefits of radium therapy and its curative properties as part of a lucrative business strategy over the counter products from fertilizers to paints and cosmetics to tonics and suppositories inspired the same level of trust in consumers as a revolutionary pharmaceutical the radium industry in the united states marketed commodities like liquid sunshine and elixir of youth at a time when using this new chemical element in the laboratory in the hospital in private clinics and in commercial settings remained largely free of regulation rentetzi shows us how marketing campaigns targeted individually to men and women affected not only how they consumed these products of science but also how that science was understood and how it contributed to the formation of ideas about gender seduced by radium ultimately reveals how innovative advertising techniques and seductive state of the art packaging made radium a routine part of american life shaping scientific knowledge about it and the identities of those who consumed it

the first article in this volume by tetu hirosige is a definitive study of the genesis of einstein s theory of relativity other articles treat topics theoretical experimental philosophical and institutional in the history of physics and chemistry from the researches of laplace and lavoisier in the eighteenth century to those of dirac and jordan in the twentieth century contents the ether problem the mechanistic world view and the origins of the theory of relativity tetu hirosige kinstein s early scientific collaboration lewis pyenson max planck s philosophy of nature and his elaboration of the special theory of relativity stanley goldberg the concept of particle creation before and after quantum mechanics joan bromberg chemistry as a branch of physics laplace s collaboration with lavoisier henry guerlac mayer s concept of force the axis of a new science of physics p m heimann debates over the theory of solution a study of dissent in physical chemistry in the english speaking world in the late nineteenth and early twentieth centuries r g a dolby the rise of physics laboratories in britain romualdas sviedrys the establishment of the royal college of chemistry an investigation of the social context of early victorian chemistry gerrylynn k roberts originally published in 1976 the princeton legacy library uses the latest print on demand technology to again make available previously out of print books from the distinguished backlist of princeton university press these editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions the goal of the princeton legacy library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by princeton university press since its founding in 1905

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