One Hundred Years Of General Relativity: From Genesis And Empirical Foundations To Gravitational Waves, Cosmology And Quantum Gravity - Volume 1

Advanced Electromagnetism: Foundations, Theory and Applications

Proceedings of the International Conference on Nonlinear Mechanics, Shanghai, China, 28-31 October 1985

Proceedings of the Third Marcel Grossmann Meeting on General Relativity

Ninth Texas Symposium on Relativistic Astrophysics

Il Nuovo cimento della Società italiana di fisica

Quantum Geometry

Scientia Sinica

Annals of the New York Academy of Sciences

Everything About Gravity - Proceedings Of The Second Lecospa International Symposium The proceedings of the 2nd LeCosPA International Symposium, "Everything about Gravity", collects 78 papers contributed by the symposium's Plenary Session and Parallel Session speakers. Organizers of the Parallel Sessions have in addition prepared summaries for their own sessions. The topics range from quasi-local energy in GR in...
the presence of gravitational radiations, a gauge theory perspective of gravity, naked black hole firewalls related to the black hole information loss paradox, a new theory of spacetime quantization, relations between the Schwinger effect and the Hawking radiation and Unruh effect, conformal frames in cosmology, surprises in nonrelativistic naturalness, inflation and tensor fluctuations, emergent spacetime for quantum gravity, understanding strongly coupled magnetism through holographic principle, the detections of dark matter, ultra-high energy cosmic neutrinos and cosmic rays, etc. Last but not least, the closing remark delivered by John Ellis raised the following question: Does cosmological inflation require a modification of Einstein's gravity? After 100 years of remarkable success of Einstein's general relativity, the development of a successful quantum theory of gravity has become a major goal in physics in the 21st century. This volume serves as a valuable reference for scientists who are interested in frontier research topics of gravity.

China Science & Technology Abstracts

Annual Report of the Institute of Physics, Academia Sinica

Finsler Geometry, Relativity and Gauge Theories Astronomy and Astrophysics Abstracts, which has appeared in semi-annual volumes since 1969, is devoted to the recording, summarizing and indexing of astronomical publications throughout the world. It is prepared under the auspices of the International Astronomical Union (according to a resolution adopted at the 14th General Assembly in 1970). Astronomy and Astrophysics Abstracts aims to present a comprehensive documentation of literature in all fields of astronomy and astrophysics. Every effort will be made to ensure that the averagetime interval between the date of receipt of the original literature and publication of the abstracts will not exceed eight months. This time interval is near to that achieved by monthly abstracting journals, compared to which our system of accumulating abstracts for about six months offers the advantage of greater convenience for the user. Volume 17 contains literature published in 1976 and received before August 15, 1976; some older literature which was received late and which is not recorded in earlier volumes is also included. We acknowledge with thanks contributions to this volume by Dr. J. Bouska, who surveyed journals and publications in the Czech language and supplied us with abstracts in English, and by the Common wealth Scientific and Industrial Research Organization (C.S.I.R.O.), Sydney, for providing titles and abstracts of papers on radio astronomy. We want to acknowledge valuable contributions to this volume by Zentralstelle fur Atomkernenergie-Dokumentation, Leopoldshafen, which supported our abstracting service by sending us retrospective literature searches.


Symposium on the Frontiers of Physics at Millennium

Scientific and Technical Aerospace Reports The methods of differential geometry have been so completely merged nowadays with physical concepts that general relativity may well be considered to be a physical theory of the geometrical properties of space-time. The general relativity principles together with the recent development of Finsler geometry as a metric generalization of Riemannian geometry justify the attempt to systematize the basic techniques for extending general relativity on the basis of Finsler geometry. It is this endeavour that forms the subject matter of the present book. Our exposition reveals the remarkable fact that the Finslerian approach is automatically permeated with the idea of the unification of the geometrical space-time picture with gauge field theory - a circumstance that we try our best to elucidate in this book. The book has been written in such a way that the reader acquainted with the methods of tensor calculus and linear algebra at the graduate level can use it as a manual of Finslerian techniques orientable to applications in several fields. The problems attached to the chapters are also intended to serve this purpose. This notwithstanding, whenever we touch upon the Finslerian refinement or generalization of physical concepts, we assume that the reader is acquainted with these concepts at least at the level of the standard textbooks, to which we refer him or her.
Proceedings of the 1980 Guangzhou Conference on Theoretical Particle Physics

Ordinary differential control theory (the classical theory) studies input/output relations defined by systems of ordinary differential equations (ODE). The various concepts that can be introduced (controllability, observability, invertibility, etc.) must be tested on formal objects (matrices, vector fields, etc.) by means of formal operations (multiplication, bracket, rank, etc.), but without appealing to the explicit integration (search for trajectories, etc.) of the given ODE. Many partial results have been recently unified by means of new formal methods coming from differential geometry and differential algebra. However, certain problems (invariance, equivalence, linearization, etc.) naturally lead to systems of partial differential equations (PDE). More generally, partial differential control theory studies input/output relations defined by systems of PDE (mechanics, thermodynamics, hydrodynamics, plasma physics, robotics, etc.). One of the aims of this book is to extend the preceding concepts to this new situation, where, of course, functional analysis and/or a dynamical system approach cannot be used. A link will be exhibited between this domain of applied mathematics and the famous ‘Backlund problem’, existing in the study of solitary waves or solitons. In particular, we shall show how the methods of differential elimination presented here will allow us to determine compatibility conditions on input and/or output as a better understanding of the foundations of control theory. At the same time we shall unify differential geometry and differential algebra in a new framework, called differential algebraic geometry.

Physics Briefs

Energy Research Abstracts

Space-time Symmetry and Quantum Yang-Mills Gravity

Continuum Mechanics This volume covers high energy physics and particle physics, astrophysics and cosmology, nuclear physics, plasma physics, condensed matter and solid state physics, high temperature superconductivity, semiconductors, optics, laser physics, biophysics, mathematical physics and quantum mechanics.

Geodesy and Physics of the Earth It is the tradition of this series of workshops that theorists and experimentalists sharing common interests discuss a variety of issues relevant to promoting the quest to unify microscopic physics and gravitation. This proceedings volume embodies that tradition. It included current hot topics such as superconducting accelerometers, low-temperature-long-distance telescopes for gravitational waves, gravitational...

Readership: Researchers in gravitation and astrophysics.

Proceedings of the Third Marcel Grossmann Meeting on General Relativity

Institute of Physics, Academia Sinica

INIS Atomindex Continuum Mechanics is the foundation for Applied Mechanics. There are numerous books on Continuum Mechanics with the main focus on the macroscale mechanical behavior of materials. Unlike classical Continuum Mechanics books, this book summarizes the advances of Continuum Mechanics in several defined areas. Emphasis is placed on the application aspect. The applications described in the book cover energy materials and systems (fuel cell materials and electrodes), materials removal, and mechanical response/deformation of structural components including plates, pipelines etc. Researchers from different fields should be benefited from reading the mechanics approached to real engineering problems.

Geometric Techniques in Gauge Theories

Gravitation and Astrophysics

Mathematical Reviews The aim of this two-volume title is to give a comprehensive review of one hundred years of development of general relativity and its scientific influences. This unique title provides a broad introduction and review to the fascinating and profound subject of general relativity, its historical development, its important theoretical consequences, gravitational wave detection and applications to astrophysics and cosmology. The series focuses on five aspects of the theory: The first three topics are covered in Volume 1 and the remaining two are covered in Volume 2. While this is a two-volume title, it is designed so that each volume can be a standalone reference volume for the related topic.

Literature 1976, Part 1

General physics, relativity, astronomy and mathematical physics and methods Advanced Electromagnetism: Foundations, Theory and Applications treats what is conventionally called electromagnetism or Maxwell's theory within the context of gauge theory or Yang-Mills theory. A major theme of this book is that fields are not stand-alone entities but are defined by their boundary conditions. The book has practical relevance to efficient antenna design, the understanding of forces and stresses in high energy pulses, ring laser gyro's, high speed computer logic elements, efficient transfer of power, parametric conversion, and many other devices and systems. Conventional electromagnetism is shown to be an underdeveloped, rather than a completely developed, field of endeavor, with major challenges in development still to be met. Contents: Foundations: Gauge Theories, and Beyond (R Aldrovandi) Helicity and Electromagnetic Field Topology (G E Marsh) Electromagnetic Gauge as Integration Condition: Einstein's Mass-
Chinese Journal of Physics YangOCoMills gravity is a new theory, consistent with experiments, that brings gravity back to the arena of gauge field theory and quantum mechanics in flat space-time. It provides solutions to long-standing difficulties in physics, such as the incompatibility between Einstein"s principle of general coordinate invariance and modern schemes for a quantum mechanical description of nature, and Noether"s OCyTheorem II OC which showed that the principle of general coordinate invariance in general relativity leads to the failure of the law of conservation of energy. YangOCoMills gravity in flat space-time appears to be more physically coherent than conventional gravity in curved space-time. The problems of quantization of the gravitational field, the operational meaning of space-time coordinates and momenta, and the conservation of energy-momentum are all resolved in YangOCoMills gravity. The aim of this book is to provide a treatment of quantum YangOCoMills gravity, with an emphasis on the ideas and evidence that the gravitational field is the manifestation of space-time translational symmetry in flat space-time, and that there exists a fundamental space-time symmetry framework that can encompass all of physics, including gravity, for all inertial and non-inertial frames of reference.

Partial Differential Equations and Group Theory

Nuclear Science Abstracts This monograph presents a review and analysis of the main mathematical, physical and epistemological difficulties encountered at the foundational level by all the conventional formulations of relativistic quantum theories, ranging from relativistic quantum mechanics and quantum field theory in Minkowski space, to the various canonical and covariant approaches to quantum gravity. It is, however, primarily devoted to the systematic presentation of a quantum framework meant to deal effectively with these difficulties by reconsidering the foundations of these subjects, analyzing their epistemic nature, and then developing mathematical tools which are specifically designed for the elimination of all the basic inconsistencies. A carefully documented historical survey is included, and additional extensive notes containing quotations from original sources are incorporated at the end of each chapter, so that the reader will be brought up-to-date with the very latest developments in quantum field theory in curved spacetime, quantum gravity and quantum cosmology. The survey further provides a backdrop against which the new foundational and mathematical ideas of the present approach to these subjects can be brought out in sharper relief.
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