

# Superstring theory

VOLUME I  
INTRODUCTION

M. B. GREEN, J. H. SCHWARZ & E. WITTEN

CAMBRIDGE MONOGRAPHS ON  
MATHEMATICAL PHYSICS

# Superstring Theory Introduction

**B.R. Iyer, N. Mukunda, C.V.  
Vishveshwara**



## **Superstring Theory Introduction:**

*Superstring Theory: Volume 1, Introduction* Michael B. Green, John H. Schwarz, Edward Witten, 2012-07-26 Twenty five years ago Michael Green John Schwarz and Edward Witten wrote two volumes on string theory Published during a period of rapid progress in this subject these volumes were highly influential for a generation of students and researchers Despite the immense progress that has been made in the field since then the systematic exposition of the foundations of superstring theory presented in these volumes is just as relevant today as when first published A self contained introduction to superstrings Volume 1 begins with an elementary treatment of the bosonic string before describing the incorporation of additional degrees of freedom fermionic degrees of freedom leading to supersymmetry and internal quantum numbers leading to gauge interactions A detailed discussion of the evaluation of tree approximation scattering amplitudes is also given Featuring a new preface setting the work in context in light of recent advances this book is invaluable for graduate students and researchers in general relativity and elementary particle theory

**Introduction to Superstrings** Michio Kaku, 2012-12-06 We are all agreed that your theory is crazy The question which divides us is whether it is crazy enough Niels Bohr Superstring theory has emerged as the most promising candidate for a quantum theory of all known interactions Superstrings apparently solve a problem that has defied solution for the past 50 years namely the unification of the two great fundamental physical theories of the century quantum field theory and general relativity Superstring theory introduces an entirely new physical picture into theoretical physics and a new mathematics that has startled even the mathematicians Ironically although superstring theory is supposed to provide a unified field theory of the universe the theory itself often seems like a confused jumble offolklore random rules of thumb and intuition This is because the development of superstring theory has been unlike that of any other theory such as general relativity which began with a geometry and an action and later evolved into a quantum theory Superstring theory by contrast has been evolving backward for the past 20 years It has a bizarre history beginning with the purely accidental discovery of the quantum theory in 1968 by G Veneziano and M Suzuki Thumbing through old math books they stumbled by chance on the Beta function written down in the last century by mathematician Leonhard Euler

*Introduction to Superstrings and M-Theory* Michio Kaku, 2012-12-06 Superstrings provocative controversial possibly untestable but unarguably one of the most interesting and active areas of research in current physics Called by some the theory of everything superstrings may solve a problem which has eluded physicists for the past 50 years the final unification of the two great theories of the twentieth century general relativity and quantum field theory Now here is a course tested comprehensive introductory graduate text on superstrings which stresses the most current areas of interest not covered in other presentation including string field theory multi loops Teichmueller spaces conformal field theory four dimensional strings The book begins with a simple discussion of point particle theory and uses the Feynman path integral technique to unify the presentation of superstrings Prerequisites are an acquaintance with quantum

mechanics and relativity This second edition has been revised and updated throughout  
 Green, John H. Schwarz, E. Witten, 2012 **Superstring Theory** Michael B. Green, 1988 *Superstring Theory: Volume 1, Introduction* Michael B. Green, John H. Schwarz, Edward Witten, 1988-07-29 Vol 1 **Superstring Theory**, 1987

**Introduction to Superstring Theory** Elias Kiritsis, 1998 String Theory now almost 30 years of age was partly forgotten but came back to the forefront of theoretical particle physics in 1984 In this book based on lectures by the author at the K U Leuven and at the University of Padova Elias Kiritsis takes the reader through the developments of the last 15 years conformal field theory the various superstrings and their spectra compactifications and the effective description of low energy degrees of freedom It ends by showing a glimpse of the most recent developments dualities of strings and higher dimensional objects that influence both traditional field theory and present day mathematics Readership Theoretical physicists and mathematicians with an interest in modern string theory

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 Theoretische natuurkunde Number of pages v 316 Width 16 cm Height 24 cm Elias Kiritsis Author all publications from this  
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 one of the most exciting and actively pursued branches of physics today The far reaching claims made for this theory would if  
 correct provide the much sought after Theory of Everything the unification of physics It would enable the fundamental  
 building blocks of matter to be identified and amalgamated in a common description with a unified theory of all the forces of  
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*Volumes)* John H Schwarz, 1985-09-01 The discovery by Green and Schwarz in 1984 that ten dimensional superstring theory  
 is anomaly free and finite only if the Yang Mills gauge group is  $SO(32)$  or  $E_8 \times E_8$  has made the phenomenological possibilities  
 of superstrings evident This has resulted in a sudden surge of interest in superstrings unification Since this fast developing  
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**Superstrings, P-branes and M-theory**, *String Theory* Joseph Polchinski, 1998-10-13 Volume 2 Superstring Theory and Beyond begins with an introduction to supersymmetric string theories and goes on to a broad presentation of the important advances of recent years The book first introduces the type I type II and heterotic superstring theories and their interactions It then goes on to present important recent discoveries about strongly coupled strings beginning with a detailed treatment of D branes and their dynamics and covering string duality M theory and black hole entropy and discusses many classic results in conformal field theory The final four chapters are concerned with four dimensional string theories and have two goals to show how some of the simplest string models connect with previous ideas for unifying the Standard Model and to collect many important and beautiful general results on world sheet and spacetime symmetries

**Gravitation, Gauge Theories and the Early Universe** B.R. Iyer, N. Mukunda, C.V. Vishveshwara, 2012-12-06 This book evolved out of some one hundred lectures given by twenty experts at a special instructional conference sponsored by the University Grants Commission India It is pedagogical in style and self contained in several interrelated areas of physics which have become extremely important in present day theoretical research The articles begin with an introduction to general relativity and cosmology as well as particle physics and quantum field theory This is followed by reviews of the standard gauge models of high energy physics renormalization group and grand unified theories The concluding parts of the book comprise discussions in current research topics such as problems of the early universe quantum cosmology and the new directions towards a unification of gravitation with other forces In addition special concise treatments of mathematical topics of direct relevance are also included The content of the book was carefully worked out for the mutual education of students and research workers in general relativity and particle physics This ambitious programme consequently necessitated the involvement of a number of different authors However care has been taken to ensure that the material meshes into a unified cogent and readable book We hope that the book will serve to initiate and guide a student in these different areas of investigation starting from first principles and leading to the exciting current research problems of an interdisciplinary nature in the context of the origin and structure of the universe

**Inflation and String Theory** Daniel Baumann, Liam McAllister, 2015-04-23 The past two decades have seen transformative advances in cosmology and string theory Observations of the cosmic microwave background have revealed strong evidence for inflationary expansion in the very early universe while new insights about compactifications of string theory have led to a deeper understanding of inflation in a framework that unifies quantum mechanics and general relativity Written by two of the leading researchers in the field this complete and accessible volume

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**Superstring Theory: Introduction. Reprinted with corrections 1988** Michael B. Green, 1987

**Introduction To String Theory And D-brane Dynamics, An: With Problems And Solutions (2nd Edition)** Richard J Szabo, 2011-01-07. This invaluable book provides a quick introduction to the rudiments of perturbative string theory and a detailed introduction to the more current topic of D brane dynamics. The presentation is very pedagogical with much of the technical detail streamlined. The rapid but highly coherent introduction to the subject is perhaps what distinguishes this book from other string theory or D brane books. This second edition includes an additional appendix with solutions to the exercises thus expanding on some of the technical material and making the book more appealing for use in lecture courses. The material is based on mini courses in theoretical high energy physics delivered by the author at various summer schools so its actual level has been appropriately tested.

**DST Workshop on Particle Physics--Superstring Theory** H. S. Mani, R. Ramachandran, 1988

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