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图书基本信息

书名：<<D膜>>

13位ISBN编号：9787510005077

10位ISBN编号：7510005078

出版时间：2010-1

出版时间：世界图书出版公司

作者：约翰逊

页数：548

前言

In view of the exciting developments in our understanding of those partic-ular aspects of fundamental physics that string theory seems to capture,it seems appropriate to collect together some of the key tools and ideaswhich helped move things forward. The developments included a truerevolution, since the physical perspective changed so radically that it un-dermined the long-standing status of strings as the basic fundamentalobjects, and instead the idea has arisen that a string theory descriptionis simply a special (albeit rather novel and beautiful) corner of a largertheory called 'M-theory'. This book is not an attempt at a history of therevolution, as we are (arguably) still in the midst of it, especially since weare in the awkward position of not knowing even one satisfactory intrin-sic definition of M-theory, and have implicit knowledge of it only throughinterconnections of its various limits. All revolutions are supposed to have a collection of characters whoplayed a crucial role in it, 'heroes' if you will. Hence, one would be ex-pected to proceed to list here the names of various individuals. WhileI was lucky to be in a position to observe a lot of the activity at first handand collect many wonderful anecdotes about how some things came to be,I will decline to start listing names at this juncture. It is too easy to yieldto the temptation to emphasise a few personalities in a short space (suchas this preface), and the result can sometimes be at the expense of others,a practice which happens all too often elsewhere. This seems to me to beespecially inappropriate in a field where the most striking characteristicof the contributions has been the collective effort of hundreds of thinkersall over the planet, often linked by e-mail and the web, often never havingmet each other in person.

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内容概要

爱因斯坦的后半生一直致力于将引力理论，纳入量子理论体系，但没有成功。
上世纪80年代，由于在弦理论研究方面取得的巨大成果，使研究者看到新的希望。
这被称为“第一次超弦革命”。
1995年，弦理论研究迎来了第二次革命。
其具有划时代意义的发现是D-膜（brane）和M-理论。
它为人类提供了探索强耦合超弦理论的强有力工具。
后继的研究表明，它也是人类理解诸如黑洞热力学微观机制、大N规范理论与引力理论之间全息对偶等深刻而未解难题的必由之路。
本书详细介绍膜理论的方方面面。
尤其对初学者，它是J.Polchinski同类专著（String Theory, 已由世图引进）极好的补充。
本书是剑桥大学出版社出版的“数学物理”丛书之一。
剑桥大学出版社出版的“数学物理”丛书，在国际上有崇高的声望。
此类图书的引进，对国内的研究者，以及研究生都有极大的帮助。

作者简介

作者：（英国）约翰逊（Clifford.V.Johnson）

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章节摘录

插图：A closer look at the world..sheetThe careful reader has patiently suspended disbelief for a while now，al-lowing US to race through a somewhat rough presentation of some of thehighlights of the construction of consistent relativistic strings.This en。
abled US，by essentially stringing lots of oscillators together，to go quitefar in developing our intuition for how things work，and for key aspectsof the language.Without promising to suddenly become rigourous，it seems a good ideato revisit some of the things we went over quickly,in order to unpacksome more details of the operation of the theory.This will allow US todevelop more tools and language for later use，and to see a bit furtherinto the structure of the theory.3.1 Conformal invarianceWe saw in section 2.2.8 that the use ofthe symmetries ofthe action to fix a gauge left over an infinite dimensional group of transformations which we could still perform and remain in that gauge.These are conformal trans-formations，and the world-sheet theory is in fact conformally invariant.It is worth digressing a little and discussing conformal invariance in arbi-trary dimensions first，before specialising to the case of two dimensions.We will find a surprising reason to come back to conformal invariance in higher dimensions much later，so there is a point to this.

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