<<纳米结构>>

图书基本信息

书名：<<纳米结构>>

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前言

This book is an introduction to the theory of nanostructures. Its main ob-iectives are twof01d：to provide basic concepts for the physics of nano-objectsand to review theoretical methods allowing the predictive simulation of nano-devices. It covers many important features of nanostructures：electronic struc-ture, dielectric properties , optical transitions and electronic transport. Eachtopic is accompanied by a review of important experimental results iu thisfield. we have tried to make the book accessible to inexperienced readersand it only requires basic knowledge in quantum mechanics and in solid statephysics. Whenever possible. each concept is introduced on the basis of simplemodels giving rise to analytical results. But we also provide the reader withthe more elaborate theoretical tools required for simulations OD computers. Therefore. this book is intended not only for the students beginning iu thisfield but also for more experienced researchers. The context of the book is the rapid expansion of nano-technologies re-sulting from important research efforts in a wide range of disciplines such asphysics, biology and chemistry. If much work is presently focusing on the elab-oration. the manipulation and the study of individual nano-objects, a majorchallenge for nano. science is to assemble these objects to make new materialsand new devices, opening the door to new technologies. In this context, as thesystems become more and more complex, and because probing the matter atthe nanoscale remains a challenge, theory and simulation play an essentialrole in the development of these technologies。
A large number of simulationtools are already available in science and technology but most of them arenot adapted to the nano-world because, at this scale, quantum mechanicaldescriptions are usually necessary, and atomistic approaches become increas-ingly important. Thus. one main objective of the book is to review recentprogress in this domain. We show that ab initio approaches provide accuratemethods to study small systems(=100-1000).

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内容概要

纳米科学的进展正在越来越依赖计算与模拟。
这取决于三个因素的结合：减小纳米物质的尺寸、增强计算机的能力、发展新的理论。
本书主要介绍了纳米结构体系中电子结构、介电性质、光学转换、电学输运的基本物理概念、理论方法、重要实验结果及其理论分析与模拟计算，是一本较为系统的、有使用价值的理论专著。
本书对从事纳米科技多学科交叉领域的高年级本科生、研究生及相关的科研教学人员具有重要的参考价值。

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插图：

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