

<<纳米电子学基础>>

图书基本信息

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## <<纳米电子学基础>>

### 内容概要

纳米电子学基础分三个部分，分别在纳米物理学、单电子效应和多电子效应方面进行介绍，内容丰富、论述详实。

书中有很多实验结果用来支持文中描述的物理概念，这使读者能够看到概念的真实性以及在实际技术中的重要应用，还有大量的章末问题能加强读者解决问题的能力。

纳米电子学基础是第一本真正适用于大学工程和应用科学学生的纳米电子学教科书。

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## 章节摘录

1.2 THE "BoTTOM—UP" APPRoACH In 1959, in what can perhaps be called the birth of nanotechnology, influential physicist (and contributor to the development of quantum theory) Richard Feynman, in a speech delivered at Caltech titled "There'S Plenty of Room at the Bottom," discussed the technological future of very small devices. In his speech he asked, "What would happen if we could shift atoms, one by one, and arrange them as we wanted?" Instruments have been developed more recently that have allowed scientists to do just that—to see and manipulate nano—and atomic—sized objects. These instruments include the scanning electron microscope (SEM), the scanning tunneling microscope (STM), the transmission electron microscope (TEM), and the atomic force microscope (AFM). In what was a remarkable feat at its time, in 1989 scientists at IBM wrote the letters IBM with atoms, by moving individual xenon atoms using STM, which has a resolution of approximately 0.1 nm, although it is limited to scanning conducting surfaces. In contrast to the "top—down" approach, this nanoscale building is called the "bottom—up" approach, and represents a much more radical technology shift, which is currently being explored in research laboratories. Of course, moving individual atoms one by one is a time-consuming process, and researchers are looking at more efficient methods of building nanoscopic structures. Many avenues are being explored in this regard, including chemical or biological self—assembly of devices, or mechanical assembly of devices by other small devices (called assemblers). Since the objects in question are tiny, often electrophoretic forces, dielectrophoretic forces, and capillary forces can be profitably used. Eric Drexler, in his 1986 book *Engines of Creation : The Coming Era of Nanotechnology*, outlines a possible future for nanotechnology and the "bottom—up," approach that has received a lot of attention.

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### 编辑推荐

《纳米电子学基础（影印版）》是国外电子信息精品著作。全书共分10个章节，大致分为三个部分，包括：纳米物理学、单电子效应和多电子效应。本书内容丰富、论述详实，适用于大学工程和应用科学学生。

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