

<<纳米力学与材料>>

图书基本信息

书名：<<纳米力学与材料>>

13位ISBN编号：9787030182562

10位ISBN编号：7030182561

出版时间：2007-1

出版时间：科学

作者：廖荣锦

页数：320

字数：530000

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

<<纳米力学与材料>>

内容概要

合成与分析纳米物质特性的能力取得了革命性的进展，广泛应用于生物医学、机械、电子、精密材料以及军事工程等领域。

纳米力学是研究和描述单个原子、系统和结构在各种载荷条件下响应的机械行为特性的学科，它的发展促进了该技术的进步。

尤其是多尺度建模方法，它可以使此领域的工程师更好的理解微纳米材料。

本书由该领域内资深专家撰写，对纳米力学和材料的基本概念进行了介绍，侧重于多重尺度建模方法和技术的研究。

本书内容包括：分子力学基础，微粒系统、晶格机械及现代多尺度建模理论等。

本书是一本相关领域电子工程师、材料科研工作者开发微纳米材料应用的全面的指南，同时也可作为微纳米力学和微纳米技术专业研究生的参考书。

<<纳米力学与材料>>

书籍目录

1 Introduction 1.1 Potential of Nanoscale Engineering 1.2 Motivation for Multiple Scale Modeling 1.3 Educational Approach
2 Classical Molecular Dynamics 2.1 Mechanics of a System of Particles 2.2 Molecular Forces 2.3 Molecular Dynamics Applications
3 Lattice Mechanics 3.1 Elements of Lattice Symmetries 3.2 Equation of Motion of a Regular Lattice 3.3 Transforms 3.4 Standing Waves in Lattices
3.5 Green's Function Methods 3.6 Quasi-Static Approximation
4 Methods of Thermodynamics and Statistical Mechanics 4.1 Basic Results of the Thermodynamic Method 4.2 Statistics of Multiparticle Systems in Thermodynamic Equilibrium 4.3 Numerical Heat Bath Techniques
5 Introduction to Multiple Scale Modeling 5.1 MAAD 5.2 Coarse-Grained Molecular Dynamics 5.3 Quasi-Continuum Method 5.4 CADD 5.5 Bridging Domain
6 Introduction to Bridging Scale 6.1 Bridging Scale Fundamentals 6.2 Removing Fine Scale Degrees of Freedom in Coarse Scale Region 6.3 Discussion on the Damping Kernel Technique 6.4 Cauchy-Born Rule 6.5 Virtual Atom Cluster Method 6.6 Staggered Time Integration Algorithm 6.7 Summary of Bridging Scale Equations 6.8 Discussion on the Bridging Scale Method
7 Bridging Scale Numerical Examples 7.1 Comments on Time History Kernel 7.2 1D Bridging Scale Numerical Examples 7.3 2D/3D Bridging Scale Numerical Examples 7.4 Two-Dimensional Wave Propagation 7.5 Dynamic Crack Propagation in Two Dimensions 7.6 Dynamic Crack Propagation in Three Dimensions 7.7 Virtual Atom Cluster Numerical Examples
8 Non-Nearest Neighbor MD Boundary Condition 8.1 Introduction 8.2 Theoretical Formulation in 3D 8.3 Numerical Examples: 1D Wave Propagation 8.4 Time-History Kernels for FCC Gold 8.5 Conclusion for the Bridging Scale Method
9 Multiscale Methods for Material Design 9.1 Multiresolution Continuum Analysis 9.2 Multiscale Constitutive Modeling of Steels 9.3 Bio-Inspired Materials 9.4 Summary and Future Research Directions
10 Bio-Nano Interface 10.1 Introduction 10.2 Immersed Finite Element Method 10.3 Vascular Flow and Blood Rheology 10.4 Electrohydrodynamic Coupling 10.5 CNT/DNA Assembly Simulation 10.6 Cell Migration and Cell-Substrate Adhesion 10.7 Conclusions
Appendix A Kernel Matrices for EAM Potential
Bibliography
Index

<<纳米力学与材料>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>