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Altri autori (Persone)	Carroll David L (David Loren)
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Nota di contenuto	One-Dimensional Metals; Table of Contents; Preface and Acknowledgments; Preface to the Second Edition; 1 Introduction; 1.1 Dimensionality; 1.2 Approaching One-dimensionality from Outside and Inside; 1.3 Dimensionality of Carbon Solids; 1.3.1 Three-dimensional Carbon: Diamond; 1.3.2 Two-dimensional Carbon: Graphite; 1.3.3 One-dimensional Carbon: Cumulene, Polycarbonyne, Polyene; 1.3.4 Zero-dimensional Carbon: Fullerene; 1.3.5 What About Something in Between?; 1.4 Peculiarities of One-dimensional Systems; 2 One-dimensional Substances; 2.1 A15 Compounds; 2.2 Krogmann Salts; 2.3 Alchemists' Gold 2.4 Bechgaard Salts and Other Charge-transfer Compounds 2.5 Polysulfurnitride; 2.6 Phthalocyanines and Other Macrocycles; 2.7 Transition Metal Chalcogenides and Halides; 2.8 Conducting Polymers; 2.9 Halogen-bridged Mixed-valence Transition Metal Complexes; 2.10 Miscellaneous; 2.10.1 Poly-deckers; 2.10.2 Polycarbenes; 2.11 Isolated

Nanowires; 2.11.1 Templates and Filler Pores; 2.11.2 Asymmetric Growth using Catalysts; 2.11.3 Nanotubes; 2.11.4 Inorganic Semiconductor Quantum Wires; 2.11.5 Metal Nanowires; 3 One-dimensional Solid-State Physics; 3.1 Crystal Lattice and Translation Symmetry

3.1.1 Classifying the Lattice; 3.1.2 Using a Coordinate System; 3.1.3 The One-dimensional Lattice; 3.2 Reciprocal Lattice, Reciprocal Space; 3.2.1 Describing Objects by Momentum and Energy; 3.2.2 Constructing the Reciprocal Lattice; 3.2.3 Application to One Dimension; 3.3 Electrons and Phonons in a Crystal, Dispersion Relations; 3.3.1 Crystal Vibrations and Phonons; 3.3.2 Phonons and Electrons are Different; 3.3.3 Nearly Free Electron Model, Energy Bands, Energy Gap, Density of States; 3.4 A Simple One-dimensional System; 4 Electron-Phonon Coupling, Peierls Transition

5 Conducting Polymers: Solitons and Polarons; 5.1 General Remarks on Conducting Polymers; 5.2 Conjugated Double Bonds; 5.3 Conjugational Defects; 5.4 Solitons; 5.5 Generation of Solitons; 5.6 Nondegenerate Ground State Polymers: Polarons; 5.7 Fractional Charges; 5.8 Soliton Lifetime; 6 Conducting Polymers: Conductivity; 6.1 General Remarks on Conductivity; 6.2 Measuring Conductivities; 6.3 Conductivity in One Dimension: Localization; 6.4 Conductivity and Solitons; 6.5 Experimental Data; 6.6 Hopping Conductivity; 6.7 Conductivity of Highly Conducting Polymers; 7 Superconductivity

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8.4 Electronic Structure, Peierls-Frohlich Mechanism of Superconductivity

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## Sommario/riassunto

Low-dimensional solids are of fundamental interest in materials science due to their anisotropic properties. Written not only for experts in the field, this book explains the important concepts behind their physics and surveys the most interesting one-dimensional systems and discusses their present and emerging applications in molecular scale electronics. The second edition of this successful book has been completely revised to include the remarkable achievements of the last ten years of research and applications. Chemists, polymer and materials scientists as well as students will find this bo

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