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Nota di contenuto	CONTENTS; PREFACE; INTRODUCTION Giles Davies; Acknowledgments; 1. THE SHAPE OF CARBON: NOVEL MATERIALS FOR THE 21ST CENTURY Humberto Terrones and Mauricio Terrones; 1 Introduction; 2 New Carbon Nanostructures: Fullerenes, Carbon Onions, Nanotubes, Etc.; 2.1 Fullerene discovery and bulk synthesis; 2.2 From giant fullerenes to graphitic onions; 2.3 Carbon nanotubes; 2.3.1 Identification and structure of carbon nanotubes; 2.3.2 Carbon nanotube production methods; 2.3.3 Mechanical properties of carbon nanotubes; 2.3.4 Electronic properties of carbon nanotubes 2.3.5 Thermal properties of carbon nanotubes 2.3.6 Carbon nanocones; 2.3.7 Negatively curved graphite: Helices, toroids, and schwarzites; 2.3.8 Haeckelites; 3 The Future of Carbon Nanostructures: Applications and Emerging Technologies; 3.1 Field emission sources; 3.2 Scanning probe tips; 3.3 Li ion batteries; 3.4 Electrochemical devices: Supercapacitors and actuators; 3.5 Molecular sensors; 3.6 Carbon-carbon nanocomposites: Joining and connecting carbon nanotubes; 3.7 Gas and hydrogen storage; 3.8 Nanotube electronic

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	devices; 3.9 Biological devices; 3.10 Nanotube polymer composites 3.11 Nanotube ceramic composites 3.12 Layered coated nanotubes; 4 Conclusions and Future Work; Acknowledgments; References; 2. INORGANIC NANOWIRES Caterina Ducati; 1 Introduction; 2 Synthesis of High Aspect Ratio Inorganic Nanostructures; 2.1 Low-temperature chemical vapor deposition of silicon nanowires; 2.2 Synthesis of RuO2 nanorods in solution; 2.3 Physical methods for the synthesis of SiC nanorods and NiS-MoS2 nanowires; 3 Outlook; Acknowledgments; References; 3. MULTILAYERED MATERIALS: A PALETTE FOR THE MATERIALS ARTIST Jon M. Molina-Aldareguia and Stephen J. Lloyd; 1 Introduction 2 Multilayers: A case where plastic .ow is confined within each layer; 4.2 TiN/SiNx multilayers: A case where columnar growth is interrupted; 4.3 TiN/SiNx multilayers revisited: A case where totally new behavior (not found in the bulk at all) is unraveled when the layers are made extremely thin; 5 Metallic Magnetic Multilayers; 6 Conclusion and Future Developments; Acknowledgments; References; 4. NATURE AS CHIEF ENGINEER Simon R. Hall; 1 Nature Inspires Engineering; 2 Nature Becomes Engineering; 3 Engineering Nature; 3.1 The future References 5. SUPRAMOLECULAR CHEMISTRY: THE "BOTTOM-UP" APPROACH TO NANOSCALE SYSTEMS Philip A. Gale; 1 Introduction; 2 Molecular Recognition; 3 Self-Assembly; 4 Self-Assembly with Covalent Modification; 5 Supramolecular Approaches to Molecular Machines; 6 Conclusion; Acknowledgment; References; 6. MOLECULAR SELF- ASSEMBLY: A TOOLKIT FOR ENGINEERING AT THE NANOMETER SCALE Christoph Walti; 1 Introduction; 2 Functionalized Surfaces; 3 DNA- Based Branched Complexes; 4 Manipulation of DNA by Electric Fields; 5 Concluding Remarks and Future Directions; Acknowledgments; References 7. EXPLORING TUNNEL TRANSPORT THROUGH PROTEIN AT THE
	MOLECULAR LEVEL Jason J. Davis, Nan Wang, Wang Xi, and Jianwei Zhao
Sommario/riassunto	This book outlines a selection of exciting advances currently being made worldwide in the field of modern engineering at the nanometer scale. Leading scientists and engineers give a general overview of research advances in their specialized subject areas. They also describe some of their own cutting-edge research and give their visions of the future. Written in a popular and well-illustrated style, the articles are written by young scientists many of whom hold, or have held, prestigious Royal Society or EPSRC Fellowships. Carefully selected by Professor A G Davies and Professor J M T Thompson