1.	Record Nr.	UNINA9910144604903321
	Titolo	Introducing molecular electronics / / edited by G. Cuniberti, G. Fagas, K. Richter
	Pubbl/distr/stampa	Berlin, Germany ; ; New York, United States : , : Springer, , [2005] ©2005
	ISBN	1-280-61046-8 9786610610464 3-540-31514-4
	Edizione	[1st ed. 2005.]
	Descrizione fisica	1 online resource (XIII, 518 p.)
	Collana	Lecture notes in physics ; ; 680
	Disciplina	621.381
	Soggetti	Molecular electronics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Note generali	Bibliographic Level Mode of Issuance: Monograph
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Theory -- Foundations of Molecular Electronics – Charge Transport in Molecular Conduction Junctions -- AC-Driven Transport Through Molecular Wires -- Electronic Structure Calculations for Nanomolecular Systems -- Ab-initio Non-Equilibrium Green's Function Formalism for Calculating Electron Transport in Molecular Devices -- Tight-Binding DFT for Molecular Electronics (gDFTB) -- Current-Induced Effects in Nanoscale Conductors -- Single Electron Tunneling in Small Molecules -- Transport through Intrinsic Quantum Dots in Interacting Carbon Nanotubes -- Introducing Molecular Electronics: A Brief Overview -- Introducing Molecular Electronics: A Brief Overview -- Experiment -- Contacting Individual Molecules Using Mechanically Controllable Break Junctions -- Intrinsic Electronic Conduction Mechanisms in Self-Assembled Monolayers -- Making Contacts to Single Molecules: Are We There Yet? -- Six Unimolecular Rectifiers and What Lies Ahead -- Quantum Transport in Carbon Nanotubes -- Carbon Nanotube Electronics and Optoelectronics -- Charge Transport in DNA-based Devices -- Outlook -- CMOL: Devices, Circuits, and Architectures -- Architectures and Simulations for Nanoprocessor Systems Integrated on the Molecular Scale.
	Sommario/riassunto	This volume presents a summary of our current understanding of

molecular electronics combined with selected state-of-the-art results at a level accessible to the advanced undergraduate or novice postgraduate. This single book comprises the basic knowledge of both theory and experiment underpinning this rapidly growing field. Concepts and techniques such as density functional theory and charge transport, break junctions and scanning probe microscopy are introduced step-by-step and are subsequently used in specific examples. The text addresses a wide range of systems including molecular junctions made of single-molecules, self-assembled monolayers, carbon nanotubes and DNA.