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Autore	Benenti Giuliano <1969->
Titolo	Principles of quantum computation and information . Volume 1 Basic concepts / / Giuliano Benenti and Giulio Casati, Giuliano Strini
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Altri autori (Persone)	CasatiGiulio <1942->
	StriniGiuliano <1937->
Disciplina	004.1
Soggetti	Quantum computers
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Introduction to classical computation. 1.1. The Turing machine. 1.2. The circuit model of computation. 1.3. Computational complexity. 1.4. Computing dynamical systems. 1.5. Energy and information. 1.6. Reversible computation. 1.7. A guide to the bibliography -- 2. Introduction to quantum mechanics. 2.1. The Stern-Gerlach experiment. 2.2. Young's double-slit experiment. 2.3. Linear vector spaces. 2.4. The postulates of quantum mechanics. 2.5. The EPR paradox and Bell's inequalities. 2.6. A guide to the bibliography -- 3. Quantum computation. 3.1. The qubit. 3.2. The circuit model of quantum computation. 3.3. Single-qubit gates. 3.4. Controlled gates and entanglement generation. 3.5. Universal quantum gates. 3.6. Unitary errors. 3.7. Function evaluation. 3.8. The quantum adder. 3.9. Deutsch's algorithm. 3.10. Quantum search. 3.11. The quantum Fourier transform. 3.12. Quantum phase estimation. 3.13. Finding eigenvalues and eigenvectors. 3.14. Period finding and Shor's algorithm. 3.15. Quantum computation of dynamical systems. 3.16. First experimental implementations. 3.17. A guide to the bibliography -- 4. Quantum communication. 4.1. Classical cryptography. 4.2. The no-cloning theorem. 4.3. Quantum cryptography. 4.4. Dense coding. 4.5 Quantum

teleportation. 4.6. An overview of the experimental implementations. 4.7. A guide to the bibliography.

Sommario/riassunto	May be used as a textbook for a one semester introductory course, both for upper level undergraduate students and for graduate students. It is also useful as general education for readers who want the fundamental principles and who have the basic background acquired from their course in physics, mathematics or computers.