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		Quantum computers
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		Logics and Meanings of Programs
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	Nota di contenuto	1 A Quantum Mechanic's Toolbox -- 2 Apples and Oranges: Matrix Representations -- 3 Circuit Model of Computation -- 4 Quantum Killer Apps: Quantum Fourier Transform and Search Algorithms -- 5 Quantum Mechanics According to Martians: Density Matrix Theory -- 6 No-Cloning Theorem, Quantum Teleportation and Spooky Correlations -- 7 Quantum Hardware I: Ion Trap qubits -- 8 Quantum Hardware II: cQED and cirQED -- 9 Errare Computatrum Est: Quiantum Error Correction.
	Sommario/riassunto	This book addresses and introduces new developments in the field of Quantum Information and Computing (QIC) for a primary audience of undergraduate students. Developments over the past few decades have spurred the need for QIC courseware at major research institutions. This book broadens the exposure of QIC science to the undergraduate market. The subject matter is introduced in such a way so that it is accessible to students with only a first-year calculus background. Greater accessibility allows a broader range of academic offerings. Courses, based on this book, could be offered in the Physics,

Engineering, Math and Computer Science departments. This textbook incorporates Mathematica-based examples into the book. In this way students are allowed a hands-on experience in which difficult abstract concepts are actualized by simulations. The students can 'turn knobs" in parameter space and explore how the system under study responds. The incorporation of symbolic manipulation software into course-ware allows a more holistic approach to the teaching of difficult concepts. Mathematica software is used here because it is easy to use and allows a fast learning curve for students who have limited experience with scientific programming.