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	Nota di contenuto	Quantum Computing A Short Course from Theory to Experiment; Contents; Preface; 1 Introduction and survey; 1.1 Information, computers and quantum mechanics; 1.1.1 Digital information; 1.1.2 Moore's law; 1.1.3 Emergence of quantum behavior; 1.1.4 Energy dissipation in computers; 1.2 Quantum computer basics; 1.2.1 Quantum information; 1.2.2 Quantum communication; 1.2.3 Basics of quantum information processing; 1.2.4 Decoherence; 1.2.5 Implementation; 1.3 History of quantum information processing; 1.3.1 Initial ideas; 1.3.2 Quantum algorithms; 1.3.3 Implementations; 2 Physics of computation 2 .1 Physical laws and information processing2.1.1 Hardware representation; 2.1.2 Quantum vs . classical information processing; 2.2 Limitations on computer performance; 2.2.1 Switching energy; 2.2.2 Entropy generation and Maxwell's demon; 2.2.3 Reversible logic; 2.2.4 Reversible gates for universal computers; 2.2.5 Processing speed; 2.2.6 Storage density; 2.3 The ultimate laptop; 2.3.1 Processing speed; 2.3.2 Maximum storage density; 3 Elements of classical computer

Sommario/riassunto	The result of a lecture series, this textbook is oriented towards students and newcomers to the field and discusses theoretical foundations as well as experimental realizations in detail. The authors are experienced teachers and have tailored this book to the needs of students. They present the basics of quantum communication and quantum information processing, leading readers to modern technical implementations. In addition, they discuss errors and decoherence as well as methods of avoiding and correcting them.