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 First NASA International Conference, QCQC '98, Palm Springs, California, USA, February 17-20, 1998, Selected Papers
 Fundamentals of Quantum Information
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 TQC 2020, June 9-12, 2020, Riga, Latvia
 7th Conference, TQC 2012, Tokyo, Japan, May 17-19, 2012, Revised Selected Papers
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 Quantum Computing
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 A Gentle Introduction
 Quantum Computing and Communications
 Theory of Quantum Computation, Communication and Cryptography
 Reports on Leading-Edge Engineering from the 2018 Symposium
 14th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2019)
 Reprint Volume with Introductory Notes for ISI TMR Network School, 12-23 July 1999, Villa Gualino, Torino, Italy
 Third Workshop, TQC 2008 Tokyo, Japan, January 30 - February 1, 2008, Revised Selected Papers
 Quantum Computing and Communications
 A Comprehensive Textbook
 Principles of Quantum Computation and Information
 Quantum Information, Computation and Communication
 15th Conference on the Theory of Quantum Computation, Communication and Cryptography
 Quantum Communication and Security
 Quantum Computation and Quantum Information
 Quantum Computation And Quantum Communication: Theory And Experiment
 History, Theories and Engineering Applications

HIGGINS HEIDI

A Short Course from Theory to Experiment MIT Press

Quantum information science is a rapidly developing field that not only promises a revolution in computer sciences but also touches deeply the very foundations of quantum physics. This book consists of a set of lectures by leading experts in the field that bridges the gap between standard textbook material and the research literature, thus providing the necessary background for postgraduate students and non-specialist researchers wishing to familiarize themselves with the subject thoroughly and at a high level. This volume is ideally suited as a course book for postgraduate students, and lecturers will find in it a large choice of material for bringing their courses up to date.

Elements of Quantum Computing Springer

Formal development of the mathematical theory of quantum information with clear proofs and exercises. For graduate students and researchers.

16th Conference on the Theory of Quantum Computation, Communication and

Cryptography (TQC 2021) Springer Science & Business Media

This book constitutes revised selected papers from the 7th Conference on Theory of Quantum Computation, Communication, and Cryptography, TQC 2012, held in Tokyo, Japan, in May 2012. The 12 papers presented were carefully reviewed and selected for inclusion in this book. They contain original research on the rapidly growing, interdisciplinary field of quantum computation, communication and cryptography. Topics addressed are such as quantum algorithms, quantum computation models, quantum complexity theory, simulation of quantum systems, quantum programming languages, quantum cryptography, quantum communication, quantum estimation, quantum measurement, quantum tomography, completely positive maps, decoherence, quantum noise, quantum coding theory, fault-tolerant quantum computing, entanglement theory, and quantum teleportation.

Frontiers of Engineering Springer

Quantum computers will revolutionize the way telecommunications networks function. Quantum computing holds the promise of solving problems that would be intractable with conventional computers by implementing principles from quantum physics in the development of computer

hardware, software and communications equipment. Quantum-assisted computing will be the first step towards full quantum systems, and will cause immense disruption of our traditional networks. The world's biggest manufacturers are investing large amounts of resources to develop crucial quantum-assisted circuits and devices. **Quantum Computing and Communications:** Gives an overview of basic quantum computing algorithms and their enhanced versions such as efficient database searching, counting and phase estimation. Introduces quantum-assisted solutions for telecom problems including multi-user detection in mobile systems, routing in IP based networks, and secure ciphering key distribution. Includes an accompanying website featuring exercises (with solution manual) and sample algorithms from the classical telecom world, corresponding quantum-based solutions, bridging the gap between pure theory and engineering practice. This book provides telecommunications engineers, as well as graduate students and researchers in the fields of computer science and telecommunications, with a wide overview of quantum computing & communications and a wealth of essential, practical information.

Quantum Communications Cambridge University Press

First-ever comprehensive introduction to the major new subject of quantum computing and

quantum information.

[Elements of Quantum Computation and Quantum Communication](#) Springer

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.

Theory of Quantum Computation, Communication, and Cryptography John Wiley & Sons

Quantum Information Theory and the Foundations of Quantum Mechanics is a conceptual analysis of one of the most prominent and exciting new areas of physics, providing the first full-length philosophical treatment of quantum information theory and the questions it raises for our understanding of the quantum world. Beginning from a careful, revisionary, analysis of the concepts of information in the everyday and classical information-theory settings, Christopher G. Timpson argues for an ontologically deflationary account of the nature of quantum information. Against what many have supposed, quantum information can be clearly defined (it is not a primitive or vague notion) but it is not part of the material contents of the world. Timpson's account sheds light on the nature of nonlocality and information flow in the presence of entanglement and, in particular, dissolves puzzles surrounding the remarkable process of quantum teleportation. In addition it permits a clear view of what the ontological and methodological lessons provided by quantum information theory are; lessons which bear on the gripping question of what role a concept like information has to play in fundamental physics. Topics discussed include the slogan 'Information is Physical', the prospects for an informational immaterialism (the view that information rather than matter might fundamentally constitute the world), and the status of the Church-Turing hypothesis in light of quantum computation. With a clear grasp of the concept of information in hand, Timpson turns his attention to the pressing question of whether advances in quantum information theory pave the way for the resolution of the traditional conceptual problems of quantum mechanics: the deep problems which loom over measurement, nonlocality and the general nature of quantum ontology. He marks out a number of common pitfalls to be avoided before analysing in detail some concrete proposals, including the radical quantum Bayesian programme of Caves, Fuchs, and Schack. One central moral which is drawn is that, for all the interest that the quantum information-inspired approaches hold, no cheap resolutions to the traditional problems of quantum mechanics are to be had.

[Progress and Prospects](#) Cambridge University Press

Quantum physics allows entirely new forms of computation and cryptography, which could perform tasks currently impossible on classical devices, leading to an explosion of new algorithms, communications protocols and suggestions for physical implementations of all these ideas. As a result, quantum information has made the transition from an exotic research topic to part of mainstream undergraduate courses in physics. Based on years of teaching experience, this textbook builds from simple fundamental concepts to cover the essentials of the field. Aimed at physics undergraduate students with a basic background in quantum mechanics, it guides readers through theory and experiment, introducing all the central concepts without getting caught up in details. Worked examples and exercises make this useful as a self-study text for those who want a brief introduction before starting on more advanced books. Solutions are available online at www.cambridge.org/9781107014466.

Theory of Quantum Computation, Communication, and Cryptography Springer

This book contains selected papers presented at the First NASA International Conference on Quantum Computing and Quantum Communications, QCQC'98, held in Palm Springs, California, USA in February 1998. As the record of the first large-scale meeting entirely devoted to quantum computing and communications, this book is a unique survey of the state-of-the-art in the area. The 43 carefully reviewed papers are organized in topical sections on entanglement and quantum

algorithms, quantum cryptography, quantum copying and quantum information theory, quantum error correction and fault-tolerant quantum computing, and embodiments of quantum computers.

Theory of Quantum Computation, Communication, and Cryptography Springer support, and to Springer for agreeing to publish these proceedings in the LNCS series.

9th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2014) Walter de Gruyter

This book constitutes the thoroughly refereed post-workshop proceedings of the 4th Workshop on Theory of Quantum Computation, Communication, and Cryptography, TQC 2009, held in Waterloo, Canada, in May 2009. The 10 revised papers presented were carefully selected during two rounds of reviewing and improvement. The papers present current original research and focus on theoretical aspects of quantum computation, quantum communication, and quantum cryptography, which are part of a larger interdisciplinary field embedding information science in a quantum mechanical framework. Topics addressed are such as quantum algorithms, models of quantum computation, quantum complexity theory, simulation of quantum systems, quantum cryptography, quantum communication, quantum estimation and measurement, quantum noise, quantum coding theory, fault-tolerant quantum computing, and entanglement theory.

Quantum Systems, Channels, Information Springer Science & Business Media

The subject of this book is theory of quantum system presented from information science perspective. The central role is played by the concept of quantum channel and its entropic and information characteristics. Quantum information theory gives a key to understanding elusive phenomena of quantum world and provides a background for development of experimental techniques that enable measuring and manipulation of individual quantum systems. This is important for the new efficient applications such as quantum computing, communication and cryptography. Research in the field of quantum informatics, including quantum information theory, is in progress in leading scientific centers throughout the world. This book gives an accessible, albeit mathematically rigorous and self-contained introduction to quantum information theory, starting from primary structures and leading to fundamental results and to exiting open problems.

Theory and Experiments IOS Press

This volume presents papers on the topics covered at the National Academy of Engineering's 2018 US Frontiers of Engineering Symposium. Every year the symposium brings together 100 outstanding young leaders in engineering to share their cutting-edge research and innovations in selected areas. The 2018 symposium was held September 5-7 and hosted by MIT Lincoln Laboratory in Lexington, Massachusetts. The intent of this book is to convey the excitement of this unique meeting and to highlight innovative developments in engineering research and technical work.

Quantum Information Theory World Scientific Publishing Company

Quantum Entanglement Manipulation - Quantum Algorithms - Quantum Complexity - Quantum Error Correction - Quantum Channels - Entanglement Purification and Long-Distance Quantum Communication - Quantum Key Distribution - Cavity Quantum Electrodynamics - Quantum Computation with Ion Traps - Josephson Junctions and Quantum Computation - Quantum Computing in Optical Lattices - Quantum Computation and Quantum Communication with Electrons - NMR Quantum Computing.

Quantum Computation and Quantum Information Theory John Wiley & Sons

While there are many available textbooks on quantum information theory, most are either too technical for beginners or not complete enough. Filling this gap, Elements of Quantum Computation and Quantum Communication gives a clear, self-contained introduction to quantum computation and communication. Written primarily for undergraduate students in p

First NASA International Conference, QCQC '98, Palm Springs, California, USA, February 17-20, 1998, Selected Papers World Scientific

A quantum computer is a computer based on a computational model which uses quantum mechanics, which is a subfield of physics to study phenomena at the micro level. There has been a

growing interest on quantum computing in the 1990's and some quantum computers at the experimental level were recently implemented. Quantum computers enable super-speed computation and can solve some important problems whose solutions were regarded impossible or intractable with traditional computers. This book provides a quick introduction to quantum computing for readers who have no backgrounds of both theory of computation and quantum mechanics. "Elements of Quantum Computing" presents the history, theories and engineering applications of quantum computing. The book is suitable to computer scientists, physicists and software engineers.

Fundamentals of Quantum Information Springer

This book constitutes the thoroughly refereed post-conference proceedings of the 5th Conference on Theory of Quantum Computation, Communication, and Cryptography, TQC 2010, held in Leeds, UK, in April 2010. The 15 revised papers presented were carefully selected during two rounds of reviewing and improvement. Focussing on theoretical aspects of quantum computation, quantum communication, and quantum cryptography - part of a larger interdisciplinary field embedding information science in a quantum mechanical framework - the papers present current original research. Topics addressed include quantum algorithms, models of quantum computation, quantum complexity theory, simulation of quantum systems, quantum cryptography, quantum communication, quantum estimation and measurement, quantum noise, quantum coding theory, fault-tolerant quantum computing, and entanglement theory.

Quantum Computation and Quantum Communication: Springer Science & Business Media

This book constitutes the thoroughly refereed post-conference proceedings of the 6th Conference on Theory of Quantum Computation, Communication, and Cryptography, TQC 2011, held in Madrid, Spain, in May 2011. The 14 revised papers presented were carefully selected from numerous submissions. The papers present new and original research and cover a large range of topics in quantum computation, communication and cryptography, a new and interdisciplinary field at the intersection of computer science, information theory and quantum mechanics.

TQC 2020, June 9-12, 2020, Riga, Latvia Springer

A thorough exposition of quantum computing and the underlying concepts of quantum physics, with explanations of the relevant mathematics and numerous examples. The combination of two of the twentieth century's most influential and revolutionary scientific theories, information theory and quantum mechanics, gave rise to a radically new view of computing and information. Quantum information processing explores the implications of using quantum mechanics instead of classical mechanics to model information and its processing. Quantum computing is not about changing the physical substrate on which computation is done from classical to quantum but about changing the notion of computation itself, at the most basic level. The fundamental unit of computation is no longer the bit but the quantum bit or qubit. This comprehensive introduction to the field offers a thorough exposition of quantum computing and the underlying concepts of quantum physics, explaining all the relevant mathematics and offering numerous examples. With its careful development of concepts and thorough explanations, the book makes quantum computing accessible to students and professionals in mathematics, computer science, and engineering. A reader with no prior knowledge of quantum physics (but with sufficient knowledge of linear algebra) will be able to gain a fluent understanding by working through the book.

7th Conference, TQC 2012, Tokyo, Japan, May 17-19, 2012, Revised Selected Papers National Academies Press

The first handbook to provide a comprehensive inter-disciplinary overview of QCC. It includes peer-reviewed definitions of key terms such as Quantum Logic Gates, Error Correction, Quantum Dots, Nuclear Magnetic Resonance, Quantum Holography, and Quantum Cryptography. There are also reports on major application areas, principles of QCC, and targets, benchmarks and challenges, making this an invaluable buy for any university department with this exciting new topic in its curriculum. It equally provides a unique overview of a fast-moving and multidisciplinary topic for researchers, students, lecturers, and even the interested amateur.