

High Lity And Quantum Well Transistors Design And Tcad Simulation Springer Series In Advanced Microelectronics

In quantum physics, we understand that the observer effect collapses wave functions into particles. The double-slit experiment suggests that a single photon can act as each wave and a particle. A single electron fired at a double slit seems to interfere with itself and act as a wave. The book speaks over True quantum behavior tends to be fragile, and attempting to the degree it regularly constitutes a chief however unavoidable disruption that generally prevents quantum weirdness from becoming at once visible. However, simply because we can not see quantum physics in movement does not suggest this is hasn't affected our lives in a tangible, high-quality way.

NSA is a comprehensive collection of international nuclear science and technology literature for the period 1948 through 1976, pre-dating the prestigious INIS database, which began in 1970. NSA existed as a printed product (Volumes 1-33) initially, created by DOE's predecessor, the U.S. Atomic Energy Commission (AEC). NSA includes citations to scientific and technical reports from the AEC, the U.S. Energy Research and Development Administration and its contractors, plus other agencies and international organizations, universities, and industrial and research organizations. References to books, conference proceedings, papers, patents, dissertations, engineering drawings, and journal articles from worldwide sources are also included. Abstracts and full text are provided if available. The scientific career of John Stewart Bell was distinguished by its breadth and its quality. He made several very important contributions to scientific fields as diverse as accelerator physics, high energy physics and the foundations of quantum mechanics. This book contains a large part of J S Bell's publications, including those that are recognized as his most important achievements, as well as others that are for no good reason less well known. The selection was made by Mary Bell, Martinus Veltman and Kurt Gottfried, all of whom were involved with John Bell both personally and professionally throughout a large part of his life. An introductory chapter has been written to help place the selected papers in a historical context and to review their significance. This book comprises an impressive collection of outstanding scientific work of one of the greatest scientists of the recent past, and it will remain important and influential for a long time to come.

Preharvest Modulation of Postharvest Fruit and Vegetable Quality is the first book to focus on the potential yield quality, quantity and safety benefits of intervention during growth. Of the many factors responsible for overall quality of produce, about 70 percent comes from pre-harvest conditions. Written by an international team of experts, this book presents the key opportunities and challenges of pre-harvest interventions. From selecting the most appropriate growing scenario, to treating plants during the maturation process, to evaluating for quality factors to determine appropriate interventions, this book provides an integrated look at maximizing crop yield through preventative means. In fact, with the very best of postharvest knowledge and technologies available, the best that can be achieved is a reduction in the rate at which products deteriorate as they progress through their normal developmental pattern of maturation, ripening and senescence. Therefore, it is very important to understand what pre-harvest factors influence the many important harvest quality attributes that affect the rate of postharvest deterioration and, subsequently, the consumers' decision to purchase the product in the marketplace. Presents the important pre-harvest factors that influence harvest quality Includes up-to-date information on pre-harvest factors that modulate post-harvest biology Identifies potential methodologies and technologies to enhance pre-harvest interventions

Characterization of Nano-Optical Materials and Optical Near-Field Interactions

Response Theory and Molecular Properties

Disruption of Quantum Physics Myths

Advances in Quantum Chemistry

High-quality-factor Si3N4 Microresonators Towards Integrated Nonlinear and Quantum Light Sources

Hearings Before the Subcommittee on Aviation of the Committee on Public Works and Transportation, House of Representatives, Ninety-fifth Congress, First Session, on H.R. 8813 . . .

Electrically gated semiconductor quantum dot devices are promising platforms for quantum information processing. Much effort has gone towards achieving high-quality quantum computation using qubits designed in these devices and high-fidelity operations have recently been demonstrated. However, the performance of these qubits is still limited by the decoherence induced by environmental noise. How to combat decoherence is thus essential to further advance the devices. In this thesis, we focus on suppressing the effects of decoherence by operating the system as fast as possible, aiming at finishing the quantum operations long before the quantum information leaves the system. Focusing on double-quantum-dot charge qubits and hybrid qubits, we design high-fidelity single-qubit rotations by using strong ac drives. Based on such strong driving techniques, we predicted that gates with fidelities higher than 99.9% can be achieved in the presence of 1/f charge noise typical of solid state devices. We further propose fast, high-fidelity entangling gates in a pair of exchange-coupled double-quantum-dot hybrid qubits by using tunnel coupling controls, yielding controlled-Z and controlled-NOT gates with fidelities higher than 99.9%. We also investigate recent experiments on a pair of exchange-coupled electron spin qubits and find that control errors and decoherence are the two dominant sources of infidelity. By increasing the gate speed and calibrating the experiments using a gate sequence that we propose, we predict that high-fidelity quantum operations on electron spin qubits are achievable.

The future development of electronics, optics, and, quite probably, quantum physics is being driven by advances in epitaxial materials. Band gap engineering, wafer bonding techniques, and epitaxial regrowth technology will push transistors far beyond the present speed barriers. Oxide growth within epitaxial layer structures and new advances in tunnel structures will push the development of the next generation of high-performance laser arrays and of efficient cascade laser designs. Perfection of the growth of semiconductor nitrides will move future electronics to higher powers and to suitability for extreme environments while revolutionizing lighting and display. Growth technologies to incorporate metallic particles and magnetic elements within high-quality semiconductors promise ultrafast electro-optical components for chemical and biological applications as well as electronically controlled magnetism for future memories and electrical/magnetic hybrid devices. Quantum dot materials will lead the field of signal electronics while hopefully providing a new proving and discovery ground for quantum physics. This paper discusses the current progress in these areas.

This book constitutes the refereed proceedings of the Second International Workshop on Machine Learning for Medical Reconstruction, MLMIR 2019, held in conjunction with MICCAI 2019, in Shenzhen, China, in October 2019. The 24 full papers presented were carefully reviewed and selected from 32 submissions. The papers are organized in the following topical sections: deep learning for magnetic resonance imaging; deep learning for computed tomography; and deep learning for general image reconstruction.

Undated Planner - Weekly & Monthly No Year Pocket Calendar Interior Details: Undated yearly overview Undated monthly overviews with ruled notes section, two pages per month Undated weekly overviews for your daily schedule with ruled notes and to-do lists One page per week 12 times: 1 monthly overview + 5 weeks 12 months on 100 bright white pages 6x9 dimensions, portable size (bag, school, home, work, desc, ...) High quality glossy softbound cover designed with love Makes an ideal present for any gift giving occasion Perfect gift idea for: birthdays, christmas, thanksgiving, family & friends, back to school, notebook & planner lovers, teachers, co-workers, boss gift, ...

Seventh Lecture International Science Lecture Series

High Quality Multiple AlGaAs/GaAs Quantum Well and Graded Refractive Index Separate Confinement Heterostructure Quantum Well Lasers Grown Via Molecular Beam Epitaxy

QuantumMarketing-Quantumnetworking

Critical Issues in Public Policy and Development

Progress in Nano-Electro Optics IV

Providing an eclectic snapshot of the current state of the art and future implications of the field, Nanomaterials, Polymers, and Devices: Materials Functionalization and Device Fabrication presents topics grouped into three categorical focuses: The synthesis, mechanism and functionalization of nanomaterials, such as carbon nanotubes, graphene, silica, and quantum dots Various functional devices which properties and structures are tailored with emphasis on nanofabrication. Among discussed are light emitting diodes, nanophotonic, nano-optical, and photovoltaic devices Nanoelectronic devices, which include semiconductor, nanotube and nanowire-based electronics, single-walled carbon-nanotube based nanoelectronics, as well as thin-film transistors

This volume focuses on the characterization of nano-optical materials and optical near-field interactions. It begins with the techniques for characterizing the magneto-optical Kerr effect and continues with methods to determine structural and optical properties in high-quality quantum wires with high spatial uniformity. Further topics include: near-field luminescence mapping in InGaN/GaN single quantum well structures in order to interpret the recombination mechanism in InGaN-based nano-structures; and theoretical treatment of the optical near field and optical near-field interactions, providing the basis for investigating the signal transport and associated dissipation in nano-optical devices. Taken as a whole, this overview will be a valuable resource for engineers and scientists working in the field of nano-electro-optics.

This title is part of UC Press's Voices Revived program, which commemorates University of California Press's mission to seek out and cultivate the brightest minds and give them voice, reach, and impact. Drawing on a backlist dating to 1893, Voices Revived makes high-quality, peer-reviewed scholarship accessible once again using print-on-demand technology. This title was originally published in 1992.

Drawing on empirical, interdisciplinary research, this book presents a critical review of some of the major issues that are of interest to researchers, policymakers and planners in developing as well as advanced countries, including specifically in India. It provides an in-depth review of some of the major development policy issues in education in general, and in India in particular, over the past 2-3 decades. Besides presenting an overview of the educational developments in India that reflects issues such as growth, equity, efficiency, foreign aid, decentralization, center-state relations, financing, and cost recovery, the book puts forward in-depth analyses of education poverty, interrelations between education and poverty, low level of outcomes in elementary education, effects of structural adjustment policies and approaches on education, south-south cooperation, etc. It also critically discusses changes in policies relating to financing higher education, external assistance for education, and how the growth of private higher education is affecting society at large. The dichotomy between public policy and action is also highlighted in many chapters. On the whole, while the importance of education is being increasingly recognized, the state does not seem to be as willing to foot the bill for education as the households and even the private sector. Occasionally contrasting with international evidence on, for example, financing higher education, private higher education, or the effects of neo-liberal policies, the book offers an interesting read for a wider audience.

High Linearity Modulation in Quantum Wells for Analog Fiber Optic Links

Single-photon Devices and Applications

Quantum Entanglement

Journal, Notebook, Diary, for Studying Quantum Theory & the Double Slit Experiment, A5 Paperback (6 X 9 Inches)100 High Quality Lined Pages, Hand Writing Notebook

A Volume in Honour of Professor Véronique Hussin

Lessons from Quantum Physics for Breakthrough Strategy, Innovation, and Leadership

Houston We Have A Quantum Mechanics Problem Journal - 6x9 - 100 Pages - College Ruled Blank Lined - Glossy Softback Cover Particle Physics Novelty: This Funny Quantum Physics Men Women Kids design would make an incredible gift for Loop Quantum Cosmology, Astronaut Quotes & Science Pun fans. Amazing Houston We Have A Quantum Mechanics Problem illustrative work with Original Cartoon Schrödinger's Space Cat & Moon. Act now & get your new favorite Particle Physics artwork or gift it to family & friends. 100 college ruled blank lined duo sided bright white pages 6x9 dimensions, portable size (bag, school, home, work, desc, ...) High quality glossy softbound cover designed with love Makes an ideal present for any gift giving occasion Perfect gift idea for: birthdays, back to school, christmas, thanksgiving, family & friends, notebook & planner lovers, teachers, graduation gifts, co-workers, boss gift, gift baskets, ...

Machine Learning for Medical Image ReconstructionSecond International Workshop, MLMIR 2019, Held in Conjunction with MICCAI 2019, Shenzhen, China, October 17, 2019, ProceedingsSpringer Nature

The role of real estate in our cities is crucial to building sustainable and resilient urban futures. Smart Urban Regeneration brings together institutional, planning and real estate insights into an innovative regeneration framework for academics, students and property professionals. Starting by identifying key urban issues within the historical urban and planning backdrop, the book goes on to explore future visions, the role of institutions and key mechanisms for smart urban regeneration. Throughout the book, international case studies and discussion questions help to draw out global implications for urban stakeholders. Real estate professionals face a real challenge to build visionary developments which resonate locally yet mitigate climate change and curb sprawl, and foster biodiversity. By avoiding the dangers of speculative excess on one side and complacency on the other, Smart Urban Regeneration shows how transformation aspirations can be achieved sustainably. Academics, students and professionals who are involved in real estate, urban planning, property investment, community development and sustainability will find this book an essential guide to smart urban regeneration investment.

Advances in Quantum Chemistry presents surveys of current developments in this rapidly developing field that falls between the historically established areas of mathematics, physics, chemistry, and biology. With invited reviews written by leading international researchers, each presenting new results, it provides a single vehicle for following progress in this interdisciplinary area. This volume continues the tradition with high quality and thorough reviews of various aspects of quantum chemistry. It contains a variety of topics that include an extended and in depth discussion on the calculation of analytical first derivatives of the energy in a similarity transformed equation of motion couples cluster method.

Fabrication of Arrays of High Quality Quantum Filaments by Deep UV Holography and MBE Growth on Channelled Substrates

Preharvest Modulation of Postharvest Fruit and Vegetable Quality

150 Years of Quantum Many-Body Theory

Quantum Computation

Advanced Epitaxy for Future Electronics, Optics, and Quantum Physics

Nuclear Science Abstracts

You'll love this Quantum Mechanics Bullet Journal Amazing quality book that makes an ideal gift for friends and family. Perfect book to write in daily, take notes and jot down ideas. 110 lightly-lined writing pages provide plenty of writing and doodle space. Compact size: 6'' wide x 9'' high; fits in most purses, backpacks, and totes. Acid-free archival-quality paper takes pen or pencil beautifully. Durable matte, sturdy paperback cover, perfectly bound, for an expert finish. The cover is professionally designed and the interior is high quality 60# stock. DMS Books prides itself on providing a wide variety of useful journals, notebooks and diaries for every occasion. This design is also available with plain lined, Cornell note taking system, college ruled, dot grid, story board, planner, calendar and doodle sketchbook interiors... plus many more. Please enjoy your purchase. xxx

In July 2000 a conference was held to honour the 65th birthdays of four of the leading international figures in the field of quantum many-body theory. The joint research careers of John Clark, Alpo Kallio, Manfred Ristig and Sergio Rosati total some 150 years, and this festschrift celebrated their achievements. These cover a remarkably wide spectrum. The topics in this book reflect that diversity, ranging from formal aspects to real systems, including nuclear and subnuclear systems, quantum fluids and solids, quantum spin systems and strongly correlated electron systems. The book collects more than 30 invited contributions from eminent scientists, chosen both from among the participants at the conference and from colleagues who were unable to attend but nevertheless wished to contribute. To match the high standing of the honourees, the articles are of an exceptionally high quality. Together they provide a vivid overview of current work across the spectrum of quantum many-body theory. Contents:A Historical PerspectiveFormal Aspects of Many-Body TheoryNuclear and Subnuclear PhysicsSpin SystemsQuantum Fluids and Solids – Bose CondensationStrongly Correlated ElectronsRelated Subjects Readership: Postdocs, researchers and academics in condensed matter and theoretical physics. Keywords:

The booklet: „QuantumMarketing – QuantumNetworking. How New Sciences revolutionize the Business & Marketing World“ presents new views and concepts and is meant for all unconventional thinkers, people who are interested in the domain Marketing, Business, Economics and all kind of Networking. Quantum physics is explained in a simple manner for laymen and how it can be applied to the Business and Marketing world. Current business models are shown and one version of the “Business of the Future” will be introduced. The author explains specific terms which she has coined according to her ideas: QuantumMarketing, QuantumNetworking/QuantumNetwork, QuantumNetworker and QuantumNetwork Coach. The book ends illustrating how the reader can become more successful with the help of this information and new knowledge.

We have demonstrated high power, high RF efficiency (-17.8 dB) analog semiconductor waveguide modulator based upon Franz-Keldysh Effect (FKE) modulation at 1.3 micrometer wavelength. The modulator has been operated with a multi-octave spurious free dynamic range (SFDR) of 106 dB-Hz, and a single octave SFDR of 124 dB-Hz. These results have been found to be independent of frequency, up to 4 GHz. We have studied and designed the waveguide modulator based upon a combination of FKE and Quantum confined Stark Effect (QCSE) for enhancing the link linear dynamic range. We have also demonstrated a dual function analog receive/transmit operation for the semiconductor electroabsorption modulator. We have demonstrated, by adjusting the bias voltage to the waveguide device, it can operate as an effective high saturation photodetector as well as an effective modulator. We have also demonstrated the first high quality strained compensated multiple quantum well InGaP/InAsP materials at both 1.3 and 1.5 micrometer wavelength. Up to one micrometer thick multiple quantum well region can be grown.

Scalable and High-sensitivity Readout of Silicon Quantum Devices

Environmental Sustainability and Climate Change Adaptation Strategies

Quantum Mechanics: Atoms Subatomic Particles Physics Theory Bullet Journal Dot Grid Bujo Daily Planner

Quantum Communications and Quantum Imaging

Strained-Layer Multiple Quantum Well for High Linearity Modulation (AASERT-93).

From c-Numbers to q-Numbers

Proceedings of SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature.

The existence of the human race has created inevitable effects on our surrounding environment. To prevent further harm to the world's ecosystems, it becomes imperative to assess mankind's impact on and create sustainability initiatives to maintain the world's ecosystems. Environmental Sustainability and Climate Change Adaptation Strategies is a pivotal reference source for the latest scholarly material on the scientific, technical, and socio-economic factors related to climate change assessment. Providing a comprehensive overview of perspectives on sustainability protection of environmental resources, this book is ideally designed for policy makers, professionals, government officials, upper-level students, and academics interested in emerging research on climate change.

The development of high efficiency III-V solar cells is needed to meet the demands of a promising renewable energy source. Intermediate band solar cells (IBSCs) using semiconductor quantum dots (QDs) have been proposed to exceed the Shockley-Queisser efficiency limit [1]. The introduction of an IB in the forbidden gap of host material generates two additional carrier transitions for sub-bandgap photon absorption, leading to increased photocurrent of IBSCs while simultaneously allowing an open-circuit voltage of the highest band gap. To realize a high efficiency IBSC, QD structures should have high crystal quality and optimized electronic properties. This dissertation focuses on the investigation and optimization of the structural and optical properties of InAs/GaAsSb QDs and the development of InAs/GaAsSb QD-based IBSCs.In the present dissertation, the interband optical transition and carrier lifetime of InAs/GaAsSb QDs with different silicon delta-doping densities have been first studied by time-integrated and time-resolved photoluminescence (PL). It is found that an optimized silicon delta-doping density in the QDs enables to fill the QD electronic states with electrons for sub-bandgap photon absorption and to improve carrier lifetime of the QDs.After that, the crystal quality and QD morphology of single- and multi-stack InAs/GaAsSb QDs with different Sb compositions have been investigated by transmission electron microscopy (TEM) and x-ray diffraction (XRD). The TEM studies reveal that QD morphology of single-stack QDs is affected by Sb composition due to strain reducing effect of Sb incorporation. The XRD studies confirm that the increase of Sb composition increases the lattice mismatch between GaAs matrix and GaAsSb spacers, resulting in increase of the strain relaxation in GaAsSb of the multi-stack QDs. Furthermore, the increase of Sb composition causes a PL redshift and increases carrier lifetime of QDs.Finally, the spacer layer thickness of multi-stack InAs/GaAsSb QDs is optimized for the growth of InAs/GaAsSb QD solar cells (QDSCs). The InAs/GaAsSb QDSCs with GaP strain compensating layer are grown and their device performances are characterized. The increase of GaP coverage is beneficial to improve the conversion efficiency of the QDSCs. However, the conversion efficiency is reduced when using a relatively large GaP coverage.

Abstract: A self-aligned process to fabricate a "metal-quantum dot-metal" structure is presented, based on an "electron beam lithography, thin film deposition and dry etching process". The sacrificial layers used can improve the lift-off process, and novel lithography layouts design can improve the mechanical strength of the fabricated nanostructures. The superiority of the self-aligned process includes low request for overlay accuracy, high compatibility with a variety of

materials, and applicable to similar structure devices fabrication. Finally, a phase change memory with fully confined phase-change material node, with the length \times width \times height of $255 \times 45 \times 30$ nm³ was demonstrated.

The Classical Analogy in the History of Quantum Theory

Bell Laboratories Talks and Papers

Tilt Magnetic Field Studies of Quantum Hall Effect in a High Quality Si/SiGe Quantum Well

*High Quality Metal-quantum Dot-metal Structure Fabricated with a Highly Compatible Self-aligned Process*Project Supported by the National Basic Research Program of China (No. 2011CB922103), and the National Natural Science Foundation of China (Nos. 61376420, 61404126, A040203).*

Technological Development and Macroscopic Quantum Experiments

BTL Talks and Papers

Diese Arbeit beschreibt die Entwicklung einer Technologie für die Herstellung hochqualitativer sub- μ m Nb/Al-AIOx/Nb-Josephson-Kontakte. Mit den dadurch entstandenen Bauteilen wurden verschiedene experimentell zuvor noch nicht beobachtete makroskopische Quanteneffekte nachgewiesen. Weiterhin wurden Nb-basierte Phasen-Qubits entworfen, hergestellt und gemessen, die längere Kohärenzzeiten als vergleichbare Bauelemente aus der Literatur aufweisen.

This volume shares and makes accessible new research lines and recent results in several branches of theoretical and mathematical physics, among them Quantum Optics, Coherent States, Integrable Systems, SUSY Quantum Mechanics, and Mathematical Methods in Physics. In addition to a selection of the contributions presented at the "6th International Workshop on New Challenges in Quantum Mechanics: Integrability and Supersymmetry", held in Valladolid, Spain, 27-30 June 2017, several high quality contributions from other authors are also included. The conference gathered 60 participants from many countries working in different fields of Theoretical Physics, and was dedicated to Prof. Véronique Hussin—an internationally recognized expert in many branches of Mathematical Physics who has been making remarkable contributions to this field since the 1980s. The reader will find interesting reviews on the main topics from internationally recognized experts in each field, as well as other original contributions, all of which deal with recent applications or discoveries in the aforementioned areas.

Advances in Quantum Chemistry presents surveys of current developments in this rapidly developing field that falls between the historically established areas of mathematics, physics, chemistry, and biology. With invited reviews written by leading international researchers, each presenting new results, it provides a single vehicle for following progress in this interdisciplinary area. This volume continues the tradition with high quality and thorough reviews of various aspects of quantum chemistry. It contains a variety of topics on the use of quantum mechanical methods to calculate molecular properties including response properties. Linear and non-linear response methods have been developed and implemented for most of the approximate wave functions used in quantum chemistry, giving a range of computational methods of varying cost and accuracy. Thus it is presently possible to calculate for example excitation energies, linear and nonlinear optical properties, one- and multi-photon transition rates, and magnetically induced transition moments for a wide range of molecules and target accuracies. These calculations aid in the interpretation of a wide range of spectroscopy including electron spin resonance, nuclear magnetic resonance and magnetic circular dichroism and general laser spectroscopy. Deep UV ($\lambda=257$ nm) holographic lithography is greatly improved by the application of an antireflective coating and a negative (chemical amplification) resist. Deep 90nm period gratings and smallest feature sizes of 40nm are transferred by dry etching to the substrate. Molecular beam epitaxial growth on finely channeled substrates allows us to fabricate high density arrays of buried GaAlAs quantum wires (filaments) (QF) with an optical quality comparable to flat quantum wells. Orientation of the grating lines along the 011 direction is shown to be the most suited for QF with very small lateral dimensions.

High Quality Nb/Al-AIOx/Nb Josephson Junctions

Smart Urban Regeneration

Aviation Regulatory Reform

National Quantum Mechanics Festival

6-8 August 2003, San Diego, California, USA

High-fidelity Quantum Gates on Quantum Dot Qubits in the Presence of 1/f Charge Noise Using Strong Drives, Numerical and Analytical Analysis

Stale ideas, conformity, and lack of imagination stymie strategic planning. Here, Gerald Harris uses seven concepts from quantum physics to pry open minds, eradicate unhealthy groupthink, spur creativity, and revitalize strategic planning. Explaining quantum concepts in plain language and using real-world examples, Harris inspires innovation while providing practical guidance for applying these ideas in actual planning situations. Just as light has a dual nature—it can be a wave and a particle—so the needs and wants of a customer can be both discrete and continuous, or the market focus of an organization can be both targeted and many faceted. Likewise, Heisenberg’s uncertainty principle—that we cannot know both the position and the speed of an electron—reminds us that it is impossible to be aware of every single relevant fact before we make a decision. Planning, he shows, must be a learning-forward process that continually adjusts to new information. Harris’s lessons act as triggers for inquiry, giving you an opportunity to discover more innovative and successful strategies.

For many RF photonic applications, low RF insertion loss, large spurious free dynamic range (SH)R links are needed. This development program demonstrated a high saturation power (46 mW), high RF efficiency (-17.8 dB) analog semiconductor waveguide modulator based upon Franz-Keldysh Effect (FKE) modulation. This was achieved with 43 mW optical power incident to the modulator. The modulator was operated with a multi-octave SFDR of 106 dB-Hz (2/3), and a single octave SH)R of 124 dB-Hz (4/5). Also introduced is a novel, dual function operation concept for the semiconductor electroabsorption modulator for operating also as an effective photodetector. The photodetector can handle more than 20 mA of photocurrent. The behavior of a waveguide modulator based upon FKE and Quantum Confined Stark Effect to achieve high linearity modulation was also modeled and documented. A first time demonstration of high quality, strain compensated multiple quantum well InGaP/InAsP materials was accomplished. Up to one micrometer thick strained multiple quantum well regions can be grown without degradation in the optical properties of the materials.

Quantum computing is predicted to provide unprecedented enhancements in computational power. A quantum computer requires implementation of a well-defined and controlled quantum system of many interconnected qubits, each defined using fragile quantum states. The interest in a spin-based quantum computer in silicon stems from demonstrations of very long spin-coherence times, high-fidelity single spin control and compatibility with industrial mass-fabrication. Industrial scale fabrication of the silicon platform offers a clear route towards a large-scale quantum computer, however, some of the processes and techniques employed in qubit demonstrators are incompatible with a dense and foundry-fabricated architecture. In particular, spin-readout utilises external sensors that require nearly the same footprint as qubit devices. In this thesis, improved readout techniques for silicon quantum devices are presented and routes towards implementation of a scalable and high-sensitivity readout architecture are investigated. Firstly, readout sensitivity of compact gate-based sensors is improved using a high-quality factor resonator and Josephson parametric amplifier that are fabricated separately from quantum dots. Secondly, an integrated transistor-based control circuit is presented using which sequential readout of two quantum dot devices using the same gate-based sensor is achieved. Finally, a large-scale readout architecture based on random-access and frequency multiplexing is introduced. The impact of readout circuit footprint on readout sensitivity is determined, showing routes towards integration of conventional circuits with quantum devices in a dense architecture, and a fault-tolerant architecture based on mediated exchange is introduced, capable of relaxing the limitations on available control circuit footprint per qubit. Demonstrations are based on foundry-fabricated transistors and few-electron quantum dots, showing that industry fabrication is a viable route towards quantum computation at a scale large enough to begin addressing the most challenging computational problems.

Over the past ten years, on-demand single photon generation has been realized in numerous physical systems including neutral atoms, ions, molecules, semiconductor quantum dots, impurities and defects in solids, and superconductor circuits. The motivations for generation and detection of single photons are two-fold: basic and applied science. On the one hand, a single photon plays a central role in the experimental foundation of quantum mechanics and measurement theory. On the other hand, an efficient and high-quality single-photon source is needed to implement quantum key distribution, quantum repeaters and photonic quantum information processing. Written by top authors from academia and industry, this is the only textbook focused on single-photon devices and thus fills the gap for a readily accessible update on the rapid progress in the field.

Quantum Mechanics, High Energy Physics And Accelerators: Selected Papers Of John S Bell (With Commentary)

Scientific and Technical Aerospace Reports

Second International Workshop, MLMIR 2019, Held in Conjunction with MICCAI 2019, Shenzhen, China, October 17, 2019, Proceedings

Integrability, Supersymmetry and Coherent States

Houston We Have a Quantum Mechanics Problem: Cool Quantum Physics Journal for Cosmology, Science, Physics, Moon Landing, Rocket & Space Exploration Fa

A Tribute to Jan Linderberg and Poul Jørgensen