

# Coherence And Quantum Optics 6

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## **Bibliography of Microwave Optical Technology** - A. F. Harvey

2012-12-06

Although microwaves and coherent optics, being two of the largest and most useful branches of electrical engineering to emerge technologically, are usually considered as distinct subjects, many of the underlying fundamental principles, scientific achievements, and practical applications have common features. Following the evolution of the initial principles and techniques during the closing decade of the last century, microwave engineering has long matured to a stage of ready availability of components, automation and accuracy of measurement, economical manufacturing methods, and application of sophisticated systems. Further, this development of electromagnetic phenomena having spatial and temporal coherence has, based on several centuries of study and practice of noncoherent light, in the last two decades reached the optical region. Hence, it is now practicable to consider a comprehensive treatment of these two fields, division being made by subject matter rather than by the artificial distinctions of frequency and/or wavelength ranges. However, a full text on the combined subjects would be very large and unwieldy and, thus, this Bibliography is presented in the hope that it will prove useful as a compact reference source to a large body of workers and, by putting forward the latest scientific and technical advances, stimulate a multi-disciplinary approach. The material of the book commences with the fundamentals of

radiation and matter, progressing through components and devices, amplification and generation, transmission, reception and processing of information, and methods of measurement to conclude with a wide range of applications.

*Modern Classical Optics* - Geoffrey Brooker 2003-08-07

The book describes classical (non-quantum) optical phenomena and the instruments and technology based on them. It includes many cutting-edge areas of modern physics and its applications which are not covered in many larger and more expensive books.

**Concepts of Quantum Optics** - P. L. Knight 2013-09-24

Concepts of Quantum Optics is a coherent and sequential coverage of some real insight into quantum physics. This book is divided into six chapters, and begins with an overview of the principles and concepts of radiation and quanta, with an emphasis on the significance of the Maxwell's electromagnetic theory of light. The next chapter describes first the properties of the radiation field in a bounded cavity, showing how each cavity field mode has the characteristics of a simple harmonic oscillator and how each can be quantized using known results for the quantum harmonic oscillator. This chapter also deals with the quantum fluctuations of the radiation field and the interpretation of a photon as an occupation of a normal mode of the system. These topics are followed by discussions of the radiation absorption and emission and the principles of coherent state and coherence functions. The final chapter considers the

concept of semi-classical theory and its connection to quantum electrodynamics. This book is of value to undergraduate and postgraduate students who are starting research in laser physics or quantum optics.

### **Coherence and Quantum Optics** - 1989

#### **Quantum Optics for Experimentalists** - Zheyu Jeff Ou 2017-05-30

This book on quantum optics is from the point of view of an experimentalist. It approaches the theory of quantum optics with the language of optical modes of classical wave theory, with which experimentalists are most familiar. This approach makes the transition easy from classical optics to quantum optics. The emphasis on the multimode description of an optical system is more realistic than in most quantum optics textbooks. After the theoretical part, the book goes directly to the two most basic experimental techniques in quantum optics and establishes the connection between the experiments and the theory. The applications include some key quantum optics experiments, and a few more current interests that deal with quantum correlation and entanglement, quantum noise in phase measurement and amplification, and quantum state measurement. Request Inspection Copy Contents: Theoretical Foundations of Quantum Optics: Historical Development of Quantum Optics and A Brief Introduction Mode Theory of Optical Fields and Their Quantization Quantum States of Single-Mode Fields Quantum States of Multi-Mode Fields Theory of Photo-detection and Quantum Theory of Coherence Generation and Transformation of Quantum States Experimental Techniques in Quantum Optics and Their Applications: Experimental Techniques of Quantum Optics I: Photon Counting Technique Applications of Photon Counting Techniques: Multi-Photon Interference and Entanglement Experimental Techniques of Quantum Optics II: Detection of Continuous Photo-Currents Applications of Homodyne Detection Technique: Quantum Measurement of Continuous Variables Quantum Noise in Phase Measurement Appendices: Derivation of an Explicit Expression for  $\hat{U}$  of a Lossless Beam Splitter Evaluation of the Two Sums in Eq. (8.100)

Readership: Advanced undergraduates, graduate students and researchers in quantum optics.

*Journal of the Optical Society of America* - 2005

#### **Selected Works of Emil Wolf** - Emil Wolf 2001

This invaluable book presents most of the important papers of Emil Wolf, published over half-a-century. It covers chiefly diffraction theory (especially the analysis of the focal region), the theory of direct and inverse scattering, phase-space methods in quantum mechanics, the foundation of radiometry, phase conjugation and coherence theory. Several papers which have become classics of the optical literature are included, such as those on Wolf's rigorous formulation of the theory of partial coherence and partial polarization, the introduction of diffraction tomography, and his discovery of correlation-induced shifts of spectral lines (often called the Wolf effect). There are also papers dealing with the historical development of optics and some review articles. Contents: Diffraction; Radiation Theory and String Excitations; Coherence and Statistical Optics; Scattering; Foundations of Radiometry; Articles of Historical Interest; Analyticity, Causality and Dispersion Relations; Scientists Who Created the World of Optics; The Development of Optical Coherence Theory; Recollections; Commencement Remarks; Publications of Emil Wolf. Readership: Physicists and engineers, particularly optical scientists and optical engineers.

*Introductory Quantum Optics* - Christopher Gerry 2005

Publisher Description

#### *Quantum Interference and Coherence* - Zbigniew Ficek 2005

This book brings together and discusses for the first time detailed analyses of the experiments with trapped ions, experiments on quantum beats, coherent population trapping, electromagnetically induced transparency (EIT), electromagnetically induced absorption, creation of dark-states polaritons, subluminal and superluminal light, realization of a Fock state, and interference experiments in atom optics on atom grating, momentum distribution, and atom tunneling. This book is unique in many respects and will fill a gap in the literature.

### **Quantum Coherence Correlation and Decoherence in**

**Semiconductor Nanostructures** - Toshihide Takagahara 2003-02-10

Semiconductor nanostructures are attracting a great deal of interest as the most promising device with which to implement quantum information processing and quantum computing. This book surveys the present status of nanofabrication techniques, near field spectroscopy and microscopy to assist the fabricated nanostructures. It will be essential reading for academic and industrial researchers in pure and applied physics, optics, semiconductors and microelectronics. The first up-to-date review articles on various aspects on quantum coherence, correlation and decoherence in semiconductor nanostructures

**Optical Coherence and Quantum Optics** - Leonard Mandel  
1995-09-29

This book presents a systematic account of optical coherence theory within the framework of classical optics, as applied to such topics as radiation from sources of different states of coherence, foundations of radiometry, effects of source coherence on the spectra of radiated fields, coherence theory of laser modes, and scattering of partially coherent light by random media.

Quantum Optics VI - Dan F. Walls 2012-12-06

Quantum Optics VI documents the most recent theoretical and experimental developments in this field, with particular emphasis on atomic optics and interferometry, which is a new and rapidly developing area of research. New methods for quantum-noise reduction are also covered.

*Quantum Optics* - Marlan O. Scully 1997-09-04

An in-depth and wide-ranging introduction to the field of quantum optics.

**Coherent Dynamics of Small Molecules in Rare Gas Crystals** - Markus Gühr 2005

**Selected Papers on Fundamentals of Quantum Optics** - Girish S. Agarwal 1995

SPIE Milestones are collections of seminal papers from the world literature covering important discoveries and developments in optics and

photonics.

**Selected Papers on Coherence and Radiometry** - Ari T. Friberg 1993

**Coherence and Quantum Optics VI** - J.H. Eberly 2012-12-06

The conference, held at the U. of Rochester in June 1989, was a sequel to five earlier meetings in this series, held in 1960, 1966, 1972, 1977 and 1983. This volume contains abbreviated versions of most of the 252 papers presented, addressing such topics as laser spectroscopy, photon statistics, pha

Optical Generation and Control of Quantum Coherence in Semiconductor Nanostructures - Gabriela Slavcheva 2010-06-01

The fundamental concept of quantum coherence plays a central role in quantum physics, cutting across disciplines of quantum optics, atomic and condensed matter physics. Quantum coherence represents a universal property of the quantum systems that applies both to light and matter thereby tying together materials and phenomena. Moreover, the optical coherence can be transferred to the medium through the light-matter interactions. Since the early days of quantum mechanics there has been a desire to control dynamics of quantum systems. The generation and control of quantum coherence in matter by optical means, in particular, represents a viable way to achieve this longstanding goal and semiconductor nanostructures are the most promising candidates for controllable quantum systems. Optical generation and control of coherent light-matter states in semiconductor quantum nanostructures is precisely the scope of the present book. Recently, there has been a great deal of interest in the subject of quantum coherence. We are currently witnessing parallel growth of activities in different physical systems that are all built around the central concept of manipulation of quantum coherence. The burgeoning activities in solid-state systems, and semiconductors in particular, have been strongly driven by the unprecedented control of coherence that previously has been demonstrated in quantum optics of atoms and molecules, and is now taking advantage of the remarkable advances in semiconductor fabrication technologies. A recent impetus to exploit the coherent

quantum phenomena comes from the emergence of the quantum information paradigm.

The Quantum Theory of Nonlinear Optics - Peter D. Drummond  
2014-03-27

This self-contained treatment of field quantization requires no prior knowledge of nonlinear optics. Supplemented by end-of-chapter exercises and detailed examples of calculation techniques in different systems, it is a valuable resource for graduate students and researchers in nonlinear optics, condensed matter physics, quantum information and atomic physics.

Optical Coherence and Quantum Optics - Leonard Mandel 1995-09-29

This book presents a systematic account of optical coherence theory within the framework of classical optics, as applied to such topics as radiation from sources of different states of coherence, foundations of radiometry, effects of source coherence on the spectra of radiated fields, coherence theory of laser modes, and scattering of partially coherent light by random media. The book starts with a full mathematical introduction to the subject area and each chapter concludes with a set of exercises. The authors are renowned scientists and have made substantial contributions to many of the topics treated in the book. Much of the book is based on courses given by them at universities, scientific meetings and laboratories throughout the world. This book will undoubtedly become an indispensable aid to scientists and engineers concerned with modern optics, as well as to teachers and graduate students of physics and engineering.

*Coherence and Quantum Optics* - L. Mandel 2012-12-06

This volume presents the written versions of papers that were delivered at the Third Rochester Conference on Coherence and Quantum Optics, held on the campus of the University of Rochester during the three days of June 21-23, 1972. The Conference was a sequel to two earlier meetings devoted to the same field of modern physics, that were also held in Rochester in 1960 and in 1966. The scope of the Conference was largely confined to basic problems in the general area of optical coherence and quantum optics, and excluded engineering applications

that are well covered by other meetings. Approximately 250 scientists from 9 countries participated, most of whom are active workers in the field. Altogether 72 papers, including 26 invited papers, were presented in 17 sessions. The papers dealt mainly with the subjects of resonant pulse propagation, lasers, quantum electrodynamics and alternative theories, optical coherence, coherence effects in spontaneous emission, light scattering, optical correlation and fluctuation measurements, coherent light interactions and quantum noise. The program was organized by a committee consisting of N. Bloembergen (Harvard University) J. H. Eberly (University of Rochester) E. L. Hahn (University of California at Berkeley) H. Haken (University of Stuttgart, Germany) M. Lax (City College of New York) B. J. Thompson (University of Rochester) L. Mandel (University of Rochester) } Joint secretaries E.

**Coherence and Quantum Optics VII** - J.H. Eberly 2013-11-11

The Seventh Rochester Conference on Coherence and Quantum Optics was held on the campus of the University of Rochester during the four-day period June 7 - 10, 1996. More than 280 scientists from 33 countries participated. This book contains the Proceedings of the meeting. This Conference differed from the previous six in the series in having only a limited number of oral presentations, in order to avoid too many parallel sessions. Another new feature was the introduction of tutorial lectures. Most contributed papers were presented in poster sessions. The Conference was sponsored by the American Physical Society, by the Optical Society of America, by the International Union of Pure and Applied Physics and by the University of Rochester. We wish to express our appreciation to these organizations for their support and we especially extend our thanks to the International Union of Pure and Applied Physics for providing financial assistance to a number of speakers from Third World countries, to enable them to take part in the meeting.

**Lectures on Light** - Stephen C. Rand 2016

This book attempts to bridge in one step the enormous gap between introductory quantum mechanics and the research front of modern optics and scientific fields that make use of light. Hence, while it is suitable as a

reference for the specialist in quantum optics, it will also be useful to the non-specialists from other disciplines who need to understand light and its uses in research. With a unique approach it introduces a single analytic tool, namely the density matrix, to analyze complex optical phenomena encountered in traditional as well as cross-disciplinary research. It moves swiftly in a tight sequence from elementary to sophisticated topics in quantum optics, including laser tweezers, laser cooling, coherent population transfer, optical magnetism, electromagnetically induced transparency, squeezed light, quantum information science and cavity quantum electrodynamics. A systematic approach is used that starts with the simplest systems - stationary two-level atoms - then introduces atomic motion, adds more energy levels, and moves on to discuss first-, second-, and third-order coherence effects that are the basis for analyzing new optical phenomena in incompletely characterized systems. Unconventional examples and original problems are used to engage even seasoned researchers in exploring a mathematical methodology with which they can tackle virtually any new problem involving light. An extensive bibliography makes connections with mathematical techniques and subject areas which can extend the benefit readers gain from each section. This revised edition includes over 40 new problems (for a total of 110 original problems with an instructor's solution manual), as well as completely new sections on quantum interference, Fano resonance, optical magnetism, quantum computation, laser cooling of solids, and irreducible representation of magnetic interactions. Literature references to current ultrafast science, nonlinear optics, x-ray and high-field physics topics have doubled at the end of chapters 5, 6, and 7; the subject index has also been significantly expanded.

**Quantum Fluctuations** - Université Joseph Fourier 1997-06-09  
Quantum fluctuations are present in many domains of physics. In recent years, there has been significant progress in the theoretical and experimental study of these fluctuations, in optics, electronics, atomic physics, metrology, relativity and cosmology. Quantum fluctuations are now observed and measured in experiments and also modified and

manipulated using elaborate techniques. These proceedings bring together young scientists who together examine new techniques and the latest research in the field. Among the topics covered are: the methods used to treat quantum fluctuations in optical systems; the recent development of the quantum stochastic methods; the interaction of light with nonlinear materials; the generation of sub-Poisson photon statistics in lasers through the pumping mechanism; the problem of measurement of electromagnetic fields; the problems of instabilities, turbulence and chaos; the analysis of phenomena related to gravity, inertia and cosmology.

**RLE Progress Report** - Massachusetts Institute of Technology.  
Research Laboratory of Electronics 1991

**Nanoscale Quantum Optics** - M. Agio 2020-10-07

With the launch of the Quantum Technology Flagship Programme by the European Commission, developments in the realization of new technologies based on quantum physics have been recognized as a priority. These are important for cryptographic techniques for telecommunications security, new computing hardware that can solve problems so far inaccessible even to the latest generation of supercomputers, and precision standards and sensors with important applications ranging from materials science to medical diagnostics. This book presents a collection of lectures from the International School of Physics Enrico Fermi on Nanoscale Quantum Optics, held in Varenna, Italy, from 23 - 28 July 2018. The course was attended by 60 students, researchers and lecturers, and provided an opportunity to train a new generation of scientists on topics that promise great innovations in science and technology. Included here are 9 lectures and seminars and 3 poster contributions from the school. Subjects covered include: basic concepts for quantum optics and quantum technologies; materials for quantum nanophotonics; quantum optics and non-classical light generation; creating quantum correlations between quantum-dot spins; platforms for telecom-entangled photon sources; nanoscale sensing and quantum coherence; and nano-optomechanics, among others. The book

offers a valuable overview of the state-of-the-art and current trends in nanoscale quantum optics. It will be invaluable for all those with an interest in this subject.

*Union List of Conference Proceedings in New Zealand Libraries - National Library of New Zealand 1977*

**Introduction to Quantum Optics** - Gilbert Grynberg 2010-09-02

Covering a number of important subjects in quantum optics, this textbook is an excellent introduction for advanced undergraduate and beginning graduate students, familiarizing readers with the basic concepts and formalism as well as the most recent advances. The first part of the textbook covers the semi-classical approach where matter is quantized, but light is not. It describes significant phenomena in quantum optics, including the principles of lasers. The second part is devoted to the full quantum description of light and its interaction with matter, covering topics such as spontaneous emission, and classical and non-classical states of light. An overview of photon entanglement and applications to quantum information is also given. In the third part, non-linear optics and laser cooling of atoms are presented, where using both approaches allows for a comprehensive description. Each chapter describes basic concepts in detail, and more specific concepts and phenomena are presented in 'complements'.

An Introduction to Quantum Optics - Yanhua Shih 2018-12-07

Authored by a highly regarded international researcher and pioneer in the field, *An Introduction to Quantum Optics: Photon and Biphoton Physics* is a straightforward overview of basic principles and experimental evidence for the quantum theory of light. This book introduces and analyzes some of the most exciting experimental research to date in the field of quantum optics and quantum information, helping readers understand the revolutionary changes occurring in optical science. Paints a picture of light in terms of general quantum interference, to reflect the physical truth behind all optical observations. Unlike most traditional books on the subject, this one introduces fundamental classical and quantum concepts and measurement

techniques naturally and gradually as it explores the process of analyzing typical experimental observations. Separating itself from other books with this uncommon focus on the experimental part of analysis, this volume: Provides a general overview of the optical coherence of light without quantization Introduces concepts and tools of field quantization and quantum optics based on the principles and rules of quantum mechanics Analyzes similarities and differences between classical and quantum coherence Concentrates on key research topics in quantum optics Explains photon and biphoton physics by examining the devices and experimental procedures used to test theories This book is basic enough for students, but it also covers a broad range of higher-level concepts that will benefit scientists and other professionals seeking to enhance their understanding of practical and theoretical aspects and new experimental methods of measurement. This material summarizes exciting developments and observations and then helps readers of all levels apply presented concepts and tools to summarize, analyze, and resolve quantum optical problems in their own work. It is a great aid to improve methods of discovering new physics and better understand and apply nontraditional concepts and interpretations in both new and historical experimental discoveries.

Fundamentals of Quantum Optics - John R. Klauder 2006-01-01

This graduate-level text surveys the fundamentals of quantum optics, including the quantum theory of partial coherence and the nature of the relations between classical and quantum theories of coherence. 1968 edition.

*Elements of Quantum Optics* - Pierre Meystre 2013-03-09

From the reviews: "This is a book that should be found in any physics library. It is extremely useful for all graduate students, Ph.D. students and researchers interested in the quantum physics of light." *Optics & Photonics News*

**ECOOSA 90 - Quantum Optics, European Conference on Optics, Optical Systems and Applications** - Mario Bertolotti 1991-06

The European Conference on Optics, Optical Systems and Applications, organized by the Optics Division of the European Physical Society, was

held in Rome on 7-9 November 1990. The programme consisted of invited and contributed papers which, together with poster presentations, enabled extensive coverage of the subject. The Conference concentrated on nonlinear and nonclassical optics and provided the opportunity for delegates to familiarize themselves with the very latest techniques and developments. ECOOSA 90 - Quantum Optics is an invaluable record of the most up-to-date developments in this rapidly growing field and, as such, will be of use to researchers in all areas of this disciplines.

Introduction to the Theory of Coherence and Polarization of Light - Emil Wolf 2007-10-11

All optical fields undergo random fluctuations. They may be small, as in the output of many lasers, or they may be appreciably larger, as in light generated by thermal sources. The underlying theory of fluctuating optical fields is known as coherence theory. An important manifestation of the fluctuations is the phenomenon of partial polarization. Actually, coherence theory deals with considerably more than fluctuations. Unlike usual treatments, it describes optical fields in terms of observable quantities and elucidates how such quantities, for example, the spectrum of light, change as light propagates. This book is the first to provide a unified treatment of the phenomena of coherence and polarization. The unification has been made possible by very recent discoveries, largely due to the author of this book. The subjects treated in this volume are of considerable importance for graduate students and for research workers in physics and in engineering, who are concerned with optical communications, with propagation of laser beams through fibers and through the turbulent atmosphere, with optical image formation, particularly in microscopes, and with medical diagnostics, for example. Each chapter contains problems to aid self-study. Book jacket.

*Quantum Atom Optics* - Tim Byrnes 2021-08-05

The rapid development of quantum technologies has driven a revolution in related research areas such as quantum computation and communication, and quantum materials. The first prototypes of functional quantum devices are beginning to appear, frequently created

using ensembles of atoms, which allow the observation of sensitive, quantum effects, and have important applications in quantum simulation and matter wave interferometry. This modern text offers a self-contained introduction to the fundamentals of quantum atom optics and atomic many-body matter wave systems. Assuming a familiarity with undergraduate quantum mechanics, this book will be accessible for graduate students and early career researchers moving into this important new field. A detailed description of the underlying theory of quantum atom optics is given, before development of the key, quantum, technological applications, such as atom interferometry, quantum simulation, quantum metrology, and quantum computing.

*A Guide to Experiments in Quantum Optics* - Hans-A. Bachor 2019-10-28  
Provides fully updated coverage of new experiments in quantum optics  
This fully revised and expanded edition of a well-established textbook on experiments on quantum optics covers new concepts, results, procedures, and developments in state-of-the-art experiments. It starts with the basic building blocks and ideas of quantum optics, then moves on to detailed procedures and new techniques for each experiment. Focusing on metrology, communications, and quantum logic, this new edition also places more emphasis on single photon technology and hybrid detection. In addition, it offers end-of-chapter summaries and full problem sets throughout. Beginning with an introduction to the subject, *A Guide to Experiments in Quantum Optics*, 3rd Edition presents readers with chapters on classical models of light, photons, quantum models of light, as well as basic optical components. It goes on to give readers full coverage of lasers and amplifiers, and examines numerous photodetection techniques being used today. Other chapters examine quantum noise, squeezing experiments, the application of squeezed light, and fundamental tests of quantum mechanics. The book finishes with a section on quantum information before summarizing of the contents and offering an outlook on the future of the field. -Provides all new updates to the field of quantum optics, covering the building blocks, models and concepts, latest results, detailed procedures, and modern experiments - Places emphasis on three major goals: metrology, communications, and

quantum logic -Presents fundamental tests of quantum mechanics (Schrodinger Kitten, multimode entanglement, photon systems as quantum emulators), and introduces the density function -Includes new trends and technologies in quantum optics and photodetection, new results in sensing and metrology, and more coverage of quantum gates and logic, cluster states, waveguides for multimodes, discord and other quantum measures, and quantum control -Offers end of chapter summaries and problem sets as new features A Guide to Experiments in Quantum Optics, 3rd Edition is an ideal book for professionals, and graduate and upper level students in physics and engineering science.

**Coherence and Quantum Optics V** - Leonard Mandel 1984-07-31

Quantum Theory of Optical Coherence - Roy J. Glauber 2007-04-09

A summary of the pioneering work of Glauber in the field of optical coherence phenomena and photon statistics, this book describes the fundamental ideas of modern quantum optics and photonics in a tutorial style. It is thus not only intended as a reference for researchers in the field, but also to give graduate students an insight into the basic theories of the field. Written by the Nobel Laureate himself, the concepts described in this book have formed the basis for three further Nobel Prizes in Physics within the last decade.

*Coherence and Quantum Optics VIII* - N.P. Bigelow 2012-12-06

The Eighth Rochester Conference on Coherence and Quantum Optics was held on the campus of the University of Rochester during the period June 13-16,2001. This volume contains the proceedings of the meeting. The meeting was preceded by an affiliated conference, the International Conference on Quantum Information, with some overlapping sessions on June 13. The proceedings of the affiliated conference will be published separately by the Optical Society of America. A few papers that were presented in common plenary sessions of the two conferences will be

published in both proceedings volumes. More than 268 scientists from 28 countries participated in the week long discussions and presentations. This Conference differed from the previous seven in the CQO series in several ways, the most important of which was the absence of Leonard Mandel. Professor Mandel died a few months before the conference. A special memorial symposium in his honor was held at the end of the conference. The presentations from that symposium are included in this proceedings volume. An innovation, that we believe made an important contribution to the conference, was the inclusion of a series of invited lectures chaired by CQO founder Emil Wolf, reviewing the history of the fields of coherence and quantum optics before about 1970. These were given by three prominent participants in the development of the field, C. Cohen-Tannoudji, I. F. Clauser, and R. I. Glauber.

Quantum Optics - Girish S. Agarwal 2013

Ideal for graduate courses on quantum optics, this textbook provides an up-to-date account of the basic principles and applications. It features end-of-chapter exercises with solutions available for instructors at [www.cambridge.org/9781107006409](http://www.cambridge.org/9781107006409). It is invaluable to both graduate students and researchers in physics and photonics, quantum information science and quantum communications.

Quantum Optics - D.F. Walls 2012-12-06

Quantum Optics gives a comprehensive coverage of developments in quantum optics over the past twenty years. In the early chapters the formalism of quantum optics is elucidated and the main techniques are introduced. These are applied in the later chapters to problems such as squeezed states of light, resonance fluorescence, laser theory, quantum theory of four-wave mixing, quantum non-demolition measurements, Bell's inequalities, and atom optics. Experimental results are used to illustrate the theory throughout. This yields the most comprehensive and up-to-date coverage of experiment and theory in quantum optics in any textbook.