

Bibliography

1960–1969

J. R. Klauder, E. C. G. Sudarshan, *Fundamentals of Quantum Optics* (Benjamin, New York 1968) The first book on quantum optics. Deals mainly with the description of quantum optical fields, rather than the evolution of damped systems, which was a subject then still in development.

1970–1979

S. M. Kay, A. Maitland ed., *Quantum Optics* (Proceedings of Scottish Universities Summer School) (Academic, New York 1970) A historical classic, in which most of main participants in the origin of quantum optics present the newly developed understanding of the laser and other quantum optical phenomena.

L. Mandel, E. Wolf, ed., *Selected Papers on Coherence and Fluctuations in Light* (2 Vols) (Dover, New York 1970) An invaluable collection which includes the main papers in which the theories of quantum damping and noise in the context of quantum optics were first developed. It can still be regarded as essential reading.

B. Davies, *Quantum Theory of Open Systems* (Academic, New York 1972) The book by Davies expresses the mathematician's view of quantum Markov processes. This is a rigorous book, and the value to physics lies in its demonstration of the self consistency of quantum Markov processes.

F. Haake, *Statistical Treatment of Open Systems by Generalized Master Equations* (Springer Tracts in Modern Physics, Vol. 66) (Springer, Berlin 1973) A summary of the state of the art (when written) of the master equation, with applications to quantum optics and solid state physics.

G. S. Agarwal, *Quantum Statistical Theories of Spontaneous Emission and their Relation to Other Approaches* (Springer Tracts in Modern Physics, Vol. 70) (Springer, Berlin 1974) Agarwal's book contains excellent early work on the use of phase space representations in quantum optical problems.

M. Sargent, M. O. Scully, W. E. Lamb, *Laser Physics* (Addison-Wesley, Reading, Mass. 1974) This book represents a viewpoint of laser and quantum damping theory as developed by Scully and Lamb in their theoretical treatment of the laser.

1980–1989

H. Spohn, *Kinetic Equations from Hamiltonian Dynamics: Markovian Limits*, *Rev. Mod. Phys.* **52**, 569 (1980) This paper deals mainly with non-quantum systems, but the section on quantum matters gives an excellent summary of the rigorous results on the Markovian limit of quantum Hamiltonian systems.

R. Loudon, *Quantum Theory of Light* (Oxford University Press, Oxford 1983) An excellent book on the physics of quantum optics.

- H. Haken, *Laser Theory* (Springer, Berlin 1970, 1984) The fundamental work on the laser. This contains the complete treatment of all kinds of laser, and goes into all the details thoroughly. It contains detailed treatments of phase space methods and master equation techniques as applied to the laser.
- H. Haken, *Light* (2 vols.) (North Holland, Amsterdam 1981, 1985) A more tutorial treatment of quantum optics than Haken's monumental "Laser Theory", which covers material on lasers, optical bistability, interaction of laser light with atoms, as well as basic quantum mechanics.
- R. Kubo, M. Toda, N. Hashitsume, *Statistical Physics II* (Nonequilibrium Statistical Mechanics) (Springer, Berlin 1985) Among the wide range of topics considered in this book is the treatment of both classical and quantum damping and noise theory. Here one can find how to treat such problems in the context of many body theory and solid state physics, rather than quantum optics.
- W. Louisell, *Quantum Statistical Properties of Radiation* (Wiley, New York 1974, 1989) An early treatment of quantum optics, damping, noise and the master equation.
- H. Risken, *The Fokker Planck Equation* (Springer, Berlin 1984, 1989) Although mainly a book on the classical Fokker-Planck equation, Risken's book contains valuable work on the semi-classical approach to the laser. The book is also valuable as a thorough handbook of methods of solution and approximation of the classical Fokker Planck equation, which is invaluable for those who wish to use phase space methods for treating master equations.

1990-1999

- H. J. Carmichael, *An Open Systems Approach to Quantum Optics* (Lectures Presented at the Université Libre de Bruxelles, October 28 to November 4, 1991) (Springer, Berlin 1993) This has become the standard work on the stochastic Schrödinger equation and wavefunction simulation methods. It pays particular attention to the measurement theoretic interpretation of the stochastic processes generated.
- W. Vogel, D.-G. Welsch, *Lectures on Quantum Optics* (Wiley, N.Y. 1994) The authors present quantum optics with a strong emphasis on the detailed analysis of the electromagnetic field.
- D. F. Walls, G. J. Milburn, *Quantum Optics* (Springer, Berlin 1994) This book can be regarded as the expression of the "New Zealand School" of quantum optics, which has been so influential in quantum optics. Dan Walls had an influence on the whole field of quantum optics which extended into every aspect of the subject. The book, written with Gerard Milburn (an early student of Walls) emphasizes how much can be learned from relatively simple models, even in the context of a sophisticated theoretical point of view.
- V. P. Belavkin, O. Hirota, R. L. Hudson ed., *Quantum Communications and Measurement* (Plenum, N.Y. 1995) This conference proceedings serves as a good introduction to the extent of the mathematical theory of quantum stochastic processes.
- L. Mandel, E. Wolf, *Optical Coherence and Quantum Optics* (Cambridge U. P., Cambridge 1995) A monumental work, which covers the complete field of quantum optics up to 1995, with a balance of experiment and theory.
- A. Griffin, D. W. Snoke, S. Stringari (eds.), *Bose-Einstein Condensation* (Cambridge, Cambridge 1996) The proceedings of a conference held the year before the announcement of the creation of the first Bose-Einstein condensate in 1995. A very good summary of the state of the subject at that time.

- U. Leonhardt, *Measuring the Quantum State of Light* (Cambridge Studies in Modern Optics) (Cambridge U.P., Cambridge 1997) A detailed description of this branch of quantum optics, including quantum tomography, a quantum description of optical instruments, and quantum measurement theory.
- P. M. Radmore, S.M. Barnett, *Methods in Theoretical Quantum Optics* (Oxford Series in Optical and Imaging Sciences, 15) (Oxford U.P., Oxford 1997) This is a book on the mathematical methods used in quantum optics.
- M. O. Scully, M. Zubairy, *Quantum Optics* (Cambridge U. P., Cambridge 1997) The summary of ideas which have had a unique influence on quantum optics.
- C. Cohen-Tannoudji, J. Dupont-Roc, G. Grynberg, *Atom-Photon Interactions* (2 vols.) (Wiley, N.Y. 1994, 1998) A very thorough and extensive treatment of the physics of atoms and light by authors who are world leaders in the field.
- H. J. Carmichael, *Statistical Methods in Quantum Optics* (2 vols) (Springer, Berlin 1999) Carmichael's treatment of quantum optics arises out of his background in the "New Zealand School", and is a very careful treatment with a strong emphasis on the physical meaning of the methodology used.
- P. Meystre, M. Sargent III, *Elements of Quantum Optics* (3rd Ed.) (Springer, New York 1999) This covers the main practical theoretical aspects of quantum optics, in a reasonably simple exposition.
- Y. Yamamoto, A. İmamoğlu, *Mesoscopic Quantum Optics* (Wiley-Interscience, New York 1999) A quantum optics book with especial attention to the theory of semiconductor lasers and non-classical light which can be produced this way.

2000-2003

- D. Bouwmeester, A. Ekert, A. Zeilinger (eds.), *The Physics of Quantum Information: Quantum Cryptography, Quantum Teleportation, Quantum Computation* (Springer, Berlin, Heidelberg, New York 2000) A collection of mainly tutorial level articles by most of the workers in quantum information, presenting the field as it was in the year 2000.
- M. Orszag, *Quantum Optics: Including Noise Reduction, Trapped Ions, Quantum Trajectories, and Decoherence* (Springer, Berlin, Heidelberg, New York 2000) A broad and up to date coverage of the basic laser-related phenomena, with a balance between experimental and theoretical aspects.
- P. Meystre, *Atom Optics* (Springer, Berlin, Heidelberg, New York 2001) The field of "Atom Optics" is broadly interpreted to cover laser cooling, propagation of atomic matter waves in linear and non-linear situations, and the elements of Bose-Einstein.
- W. P. Schleich, *Quantum Optics in Phase Space* (John Wiley & Sons, New York 2001) This book presents quantum optics with a particular emphasis on phase space methods, the Wigner function in particular.
- L. P. Pitaevskii, S. Stringari, *Bose-Einstein Condensation* (Oxford, Oxford 2003) Two of the leading figures in the field of Bose-Einstein condensation present the basics of the theory, as well as a review of the state of the field as of the year 2003, written from the point of view of condensed matter theory.
- W. H. Zurek, *Decoherence, Einselection, and the Quantum origins of the Classical*, *Rev. Mod. Phys.* **75**, 715 (2003) A thorough review and assessment of the foundations of quantum measurement theory using decoherence as the fundamental explanation for the existence of classical physics, the germ of which is reviewed in Sect.7.3 of this book.