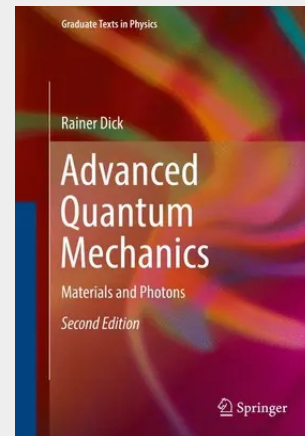


Advanced Quantum Mechanics

Materials and Photons

In this updated and expanded second edition of a well-received and invaluable textbook, Prof. Dick emphasizes the importance of advanced quantum mechanics for materials science and all experimental techniques which employ photon absorption, emission, or scattering. Important aspects of introductory quantum mechanics are covered in the first seven chapters to make the subject self-contained and accessible for a wide audience. Advanced Quantum Mechanics, Materials and Photons can therefore be used for advanced undergraduate courses and introductory graduate courses which are targeted towards students with diverse academic backgrounds from the Natural Sciences or Engineering. To enhance this inclusive aspect of making the subject as accessible as possible Appendices A and B also provide introductions to Lagrangian mechanics and the covariant formulation of electrodynamics. This second edition includes an additional 62 new problems as well as expanded sections on relativistic quantum fields and applications of quantum electrodynamics. Other special features include an introduction to Lagrangian field theory and an integrated discussion of transition amplitudes with discrete or continuous initial or final states. Once students have acquired an understanding of basic quantum mechanics and classical field theory, canonical field quantization is easy. Furthermore, the integrated discussion of transition amplitudes naturally leads to the notions of transition probabilities, decay rates, absorption cross sections and scattering cross sections, which are important for all experimental techniques that use photon probes.

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74,89 €
69,99 € (zzgl. MwSt.)

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Artikelnummer: 9783319256740
Medium: Buch
ISBN: 978-3-319-25674-0
Verlag: Springer
Erscheinungstermin: 11.07.2016
Sprache(n): Englisch
Auflage: 2. Auflage 2016
Serie: Graduate Texts in Physics
Produktform: Gebunden
Gewicht: 11819 g
Seiten: 692
Format (B x H): 155 x 235 mm

