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Titolo	Sparse Grids and Applications - Miami 2016 / Jochen Garcke ... [et al.] editors
Pubbl/distr/stampa	x, 251 p., : ill. ; 24 cm
Edizione	[Cham : Springer, 2018]
Descrizione fisica	Pubblicazione in formato elettronico
Soggetti	65Nxx - Numerical methods for partial differential equations, boundary value problems [MSC 2020] 65Dxx - Numerical approximation and computational geometry (primarily algorithms) [MSC 2020] 65Y20 - Complexity and performance of numerical algorithms [MSC 2020] 65M12 - Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs [MSC 2020] 62Hxx - Multivariate analysis [MSC 2020]
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

2. Record Nr. UNINA9910828088703321

Autore	Hau-Riege Stefan P.
Titolo	Nonrelativistic quantum x-ray physics / / Stefan P. Hau-Riege
Pubbl/distr/stampa	Weinheim, Germany : , : Wiley, , [2015] ©2015
ISBN	3-527-66452-1 3-527-66449-1 3-527-66451-3
Descrizione fisica	1 online resource (570 p.)
Disciplina	539.7222
Soggetti	Quantum theory Mechanics X-rays Mathematical physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Related Titles; Title Page; Copyright; Dedication; Preface; Part 1: Introduction; Chapter 1: Introduction; 1.1 Motivation; 1.2 Comparing X-Rays with Optical Radiation; 1.3 Novel X-Ray Sources; 1.4 Unit Systems; 1.5 Overview of Lagrangian and Hamiltonian Mechanics; 1.6 Approximations; Chapter 2: Review of Some Concepts in Quantum Mechanics; 2.1 Introduction; 2.2 Dirac"s Bra-Ket (Bracket) Notation; 2.3 Eigenvalues and Eigenfunctions; 2.4 Functions of Operators; 2.5 Point Particle in a Radially Symmetric Potential; 2.6 Mixed States 2.7 Schrodinger and Heisenberg Pictures of Quantum Mechanics 2.8 Representing Quantum Mechanics in Position and Momentum Space; 2.9 Transition from Classical Mechanics to Quantum Mechanics; 2.10 Molecular Orbital Approximation; Part II: Quantization of the Free Electromagnetic Field; Chapter 3: Classical Electromagnetic Fields; 3.1 Introduction; 3.2 Maxwell"s Equations; 3.3 Electromagnetic Potentials; 3.4 Transverse and Longitudinal Maxwell"s Equations; 3.5 The Free Electromagnetic Field as a Sum of Mode Oscillators 3.6 Charged Particle in an Electromagnetic Field and the Minimal-Coupling Hamiltonian Chapter 4: Harmonic Oscillator; 4.1 Introduction;

4.2 Classical Harmonic Oscillator with One Degree of Freedom; 4.3 Quantum Mechanical Harmonic Oscillator; 4.4 N-Dimensional Quantum Mechanical Harmonic Oscillator; Chapter 5: Quantization of the Electromagnetic Field; 5.1 Introduction; 5.2 Transition to a Quantum Mechanical Description; 5.3 Photon Number States (hucFock States); 5.4 Photons; Chapter 6: Continuous Fock Space; 6.1 Introduction; 6.2 Three-Dimensional Continuum Field; 6.3 One-Dimensional Treatment Chapter 7: Coherence 7.1 Introduction; 7.2 Review of Classical Coherence Theory; 7.3 Quantum Coherence Theory; Chapter 8: Examples for Electromagnetic States; 8.1 Introduction; 8.2 Quantum Phase of Radiation Fields; 8.3 Single-Mode States; 8.4 Multimode States; 8.5 One-Dimensional Continuum Mode States; Part III: Interaction of X-Rays with Matter; Chapter 9: Interaction of the Electromagnetic Field with Matter; 9.1 Introduction; 9.2 Tensor Product of Matter and Radiation Hilbert Spaces; 9.3 Interaction Hamiltonian for the Electromagnetic Field and Matter
Chapter 10: Time-Dependent Perturbation Theory 10.1 Introduction; 10.2 Interaction Picture; 10.3 Transition Probabilities; 10.4 Perturbative Expansion of Transition Amplitudes; 10.5 Time-Dependent Perturbation Theory for Mixed States; Chapter 11: Application of Perturbation Theory to the Interaction of Electromagnetic Fields with Matter; 11.1 Introduction; 11.2 Feynman Diagrams; 11.3 Mixed States; Part IV: Applications of X-Ray-Matter-Interaction Theory; Chapter 12: X-Ray Scattering by Free Electrons; 12.1 Introduction; 12.2 Energy and Momentum Conservation; 12.3 Scattering Cross Section
12.4 Scattering From an Electron at Rest

Sommario/riassunto

Providing a solid theoretical background in photon-matter interaction, Nonrelativistic Quantum X-Ray Physics enables readers to understand experiments performed at XFEL-facilities and x-ray synchrotrons. As a result, after reading this book, scientists and students will be able to outline and perform calculations of some important x-ray-matter interaction processes. Key features of the contents are that the scope reaches beyond the dipole approximation when necessary and that it includes short-pulse interactions. To aid the reader in this transition, some relevant examples are discussed in