Physics of Atoms and Molecules

second edition

B.H. Bransden &

C.J. Joachain



Physics Of Atoms And Molecules 2nd Edition

Sune Svanberg

Physics Of Atoms And Molecules 2nd Edition:

Physics of Atoms and Molecules B. H. Bransden, Charles Jean Joachain, 2003 The study of atomic and molecular physics is a key component of undergraduate courses in physics because of its fundamental importance to the understanding of many aspects of modern physics. The aim of this new edition is to provide a unified account of the subject within an undergraduate framework taking the opportunity to make improvements based on the teaching experience of users of the first edition and cover important new developments in the subject Key features of this new edition Revised material on molecular structure and spectra Extended material on electronic and atomic collisions A new chapter describing applications based on the use of the maser and the laser including laser spectroscopy laser cooling and trapping of atoms Bose Einstein condensation atom lasers and atomic systems in intense laser fields A new chapter describing other applications including magnetic resonance atom optics atoms in cavities ions in traps atomic clocks and astrophysics Revised appendices include new material on molecules and updated tables of physical constants Solutions of selected problems B H Bransden is Emeritus Professor of Theoretical Physics at the University of Durham C J Joachain is Professor of Theoretical Physics at the University of Brussels They are co authors of Quantum Mechanics also published by Prentice Hall *Physics of Atoms and Molecules* Brian Harold Bransden, 1986 Atomic and Molecular Spectroscopy Sune Syanberg, 2023-01-06 A wide ranging review of modern spectroscopic techniques such as X ray photoelectron optical and laser spectroscopy and radiofrequency and microwave techniques On the fundamental side the book focuses on physical principles and the impact of spectroscopy on our understanding of the building blocks of matter while in the area of applications particular attention is given to those in chemical analysis photochemistry surface characterisation environmental and medical diagnostics remote sensing and astrophysis The Fourth Edition also provides the reader with an update on laser cooling and trapping Bose Einstein condensation ultra fast spectroscopy high power laser matter interaction satellite based astronomy and spectroscopic aspects of laser medicine Atom, Molecule, and Cluster Beams II Hans Pauly, 2013-04-17 This book completes the physical foundations and experimental techniques described in volume 1 with an updated review of the accessory equipment indispensable in molecular beam experiments It extends the subject to cluster beams and beams of hyperthermal and subthermal energies Fundamentals of Photonics Bahaa E. A. Saleh, Malvin Carl Teich, 2007-03-09 Fundamentals of Photonics A complete thoroughly updated full color second edition Now in a new full color edition Fundamentals of Photonics Second Edition is a self contained and up to date introductory level textbook that thoroughly surveys this rapidly expanding area of engineering and applied physics Featuring a logical blend of theory and applications coverage includes detailed accounts of the primary theories of light including ray optics wave optics electromagnetic optics and photon optics as well as the interaction of photons and atoms and semiconductor optics Presented at increasing levels of complexity preliminary sections build toward more advanced topics such as Fourier optics and holography guided wave and fiber optics

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Ingolf V. Hertel, Claus-Peter Schulz, 2014-10-22 This is the second volume of textbooks on atomic molecular and optical physics aiming at a comprehensive presentation of this highly productive branch of modern physics as an indispensable basis for many areas in physics and chemistry as well as in state of the art bio and material sciences It primarily addresses advanced students including PhD students but in a number of selected subject areas the reader is lead up to the frontiers of

present research Thus even the active scientist is addressed This volume 2 introduces lasers and quantum optics while the main focus is on the structure of molecules and their spectroscopy as well as on collision physics as the continuum counterpart to bound molecular states The emphasis is always on the experiment and its interpretation while the necessary theory is introduced from this perspective in a compact and occasionally somewhat heuristic manner easy to follow even for Mathematical Methods for Physicists George Brown Arfken, George B. Arfken, Hans J. Weber, Frank E. Harris, 2013 Table of Contents Mathematical Preliminaries Determinants and Matrices Vector Analysis Tensors and Differential Forms Vector Spaces Eigenvalue Problems Ordinary Differential Equations Partial Differential Equations Green s Functions Complex Variable Theory Further Topics in Analysis Gamma Function Bessel Functions Legendre Functions Angular Momentum Group Theory More Special Functions Fourier Series Integral Transforms Periodic Systems Integral Equations Mathieu Functions Calculus of Variations Probability and Statistics A selective, annotated and graded list of United States publications in the physical and applied sciences R.R. Bowker Company, 1966* Introduction to **Atomic and Molecular Spectroscopy** Vimal Kumar Jain, 2007 Discusses one electron system vector representation of momenta and vector coupling approximations atomic spectra of hydrogen atom alkali metal atoms helium and two valence electron systems X ray spectroscopy hyperfine structure and isotope shifts linewidths effect of external fields on atoms and more

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