Journal Of Physics B Atomic Molecular And Optical

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This volume contains very carefully compiled material presenting bibliographic descriptions of approximately 3500 papers, with a computer-generated index on authors, subject headings, corporate addresses and journals. There are many on-line services available on fullerenes, but they serve mainly current-awareness functions; none of them is selectively complete and carefully indexed and none can replace a complete retrospective bibliography, which most researchers in the field would want to have on hand in their laboratories and offices.

The study of condensed matter using optical techniques, where photons act as both probe and signal, has a long history. It is only recently, however, that the extraction of surface and interface information, with submonolayer resolution, has been shown to be possible using

optical techniques (where "optical" applies to electromagnetic radiation in and around the visible region of the spectrum). This book describes these "epioptic" techniques, which have now been quite widely applied to semiconductor surfaces and interfaces. Particular emphasis in the book is placed on recent studies of submonolayer growth on well-characterised semiconductor surfaces, many of which have arisen from CEC DGJGII ESPRIT Basic Research Action No. 3177 "EPIOPTIC", and CEU DGIII ESPRIT Basic Research Action No. 6878 "EASI". Techniques using other areas of the spectrum such as the infra-red region (IR spectroscopy, in its various surface configurations), and the x-ray region (surface x-ray diffraction, x-ray standing wave), are omitted. The optical techniques described use simple lamp or small laser sources and are thus, in principle, easily accessible. Epioptic probes can provide new information on solid-gas, solid-liquid and liquid-liquid interfaces. They are particularly suited to growth monitoring. Emerging process technologies for fabricating submicron and nanoscale semiconductor devices and novel multilayer materials, whether based on silicon or compound semiconductors, all require extremely precise control of growth at surfaces. In situ, non-destructive, real-time monitoring and characterisation of surfaces under growth conditions is needed for further progress. Both atomic scale resolution, and non-destructive characterisation of buried structures, are required.

The field of High-Resolution Spectroscopy has been considerably extended and even redefined in some areas. Combining the knowledge of spectroscopy, laser technology, chemical computation, and experiments, Handbook of High-Resolution Spectroscopy provides a comprehensive survey of the whole field as it presents itself today, with emphasis on the recent developments. This essential handbook for advanced research students, graduate

students, and researchers takes a systematic approach through the range of wavelengths and includes the latest advances in experiment and theory that will help and guide future applications. The first comprehensive survey in high-resolution molecular spectroscopy for over 15 years Brings together the knowledge of spectroscopy, laser technology, chemical computation and experiments Brings the reader up-to-date with the many advances that have been made in recent times Takes the reader through the range of wavelengths, covering all possible techniques such as Microwave Spectroscopy, Infrared Spectroscopy, Raman Spectroscopy, VIS, UV and VUV Combines theoretical, computational and experimental aspects Has numerous applications in a wide range of scientific domains Edited by two leaders in this field Provides an overview of rotational, vibration, electronic and photoelectron spectroscopy Volume 1 - Introduction: Fundamentals of Molecular Spectroscopy Volume 2 - High-Resolution Molecular Spectroscopy: Methods and Results Volume 3 - Special Methods & Applications

Jonelle Harvey's book outlines two related experimental techniques, threshold photoelectron spectroscopy and threshold photoelectron photoion coincidence techniques, which are utilised to investigate small halogenated molecules. All the experiments were conducted at the vacuum ultraviolet beamline of the Swiss Light Source, a synchrotron photon source, which has the advantage over popular laser photon-sources of extreme ease of tunability. Three studies are presented which combine experimental and computational ab initio approaches: studying the fast dissociations of halogenated methanes in order to construct a self-consistent thermochemical network; investigating the fragmentations of fluoroethenes from timebombs, which break apart very slowly but explosively, to fast dissociators; and uncovering how vital

conical interactions underpin both the results of photoelectron spectra and dissociation patterns. The details included in this thesis are useful for researchers working in the same field and those readers wishing to obtain a solid introduction into the types of systems encountered in threshold photoelectron photoion coincidence spectroscopy.

Covers quantum scattering theories, experimental and theoretical calculations and applications in a comprehensive manner.

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In the 50 years since the first volume of Progress in Optics was published, optics has become one of the most dynamic fields of science. The volumes in this series that have appeared up to now contain more than 300 review articles by distinguished research workers, which have become permanent records for many important developments. Invariant Optical Fields Quantum Optics in Structured Media Polarization and Coherence Optics Optical Quantum Computation Photonic Crystals Lase Beam-Splitting Gratings

This century has seen the development of technologies for manipulating and controlling matter and light at the level of individual photons and atoms, a realm in which physics is fully quantum-mechanical. The dominant experimental technology is the laser, and the

theoretical paradigm is quantum optics. The Quantum World of Ultra-Cold Atoms and Light is a trilogy, which presents the quantum optics way of thinking and its applications to quantum devices. This book — The Physics of Quantum-Optical Devices — provides a comprehensive treatment of theoretical quantum optics. It covers applications to the optical manipulation of the quantum states of atoms, laser cooling, continuous measurement, quantum computers and quantum processors, superconducting systems and quantum networks. The subject is consistently formulated in terms of quantum stochastic techniques, and a systematic and thorough development of these techniques is a central part of the book. There is also a compact overview of the ideas of quantum information theory. The main aim of the book is to present the theoretical techniques necessary for the understanding of quantum optical devices, with special attention to those devices used in quantum information processing and quantum simulation. Although these techniques were developed originally for the optical regime, they are also applicable to electromagnetic radiation from the microwave realm to the ultra-violet, and for atomic systems, Josephson junction systems, quantum dots and nano-mechanical systems. For more information, please visit: http://europe.worldscientific.com/quantum-world-of-ultra-cold-atoms-and-light.html

The reader will find in this collection a clear exposition of the method of the Screen Constant by Nuclear Charge Unit which can be applied in a simple and immediate way to many fields of Physics in relation to atomic spectroscopy.

Transition Elements: Advances in Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Transition Elements. The editors have built Transition Elements: Advances in Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Transition Elements in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Transition Elements: Advances in Research and Application: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Written by world-class authors, this most recent major book on the topic highlights new and current trends as well as future directions. It is comprehensive in its scope, covering all aspects of gold chemistry -- from homogeneous to heterogeneous catalysis, from supramolecular assemblies to sensors and medicinal applications. The result is an invaluable work for both organic and inorganic chemists working in universities and industry, as well as material scientists.

Here is an introduction to the theory of atomic and molecular collision processes which occur in the interstellar medium. The text deals primarily with processes that occur in interstellar molecular clouds, where the electron density is low and collisions with the abundant neutral species H, H2 and He predominate.
Refractive Errors: Advances in Research and Treatment: 2011 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Refractive Errors in a concise format. The editors have built Refractive Errors: Advances in Research and Treatment: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Refractive Errors in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Refractive Errors: Advances in Research and Treatment: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.
Practical Aspects of Computational Chemistry I: An Overview of the Last Two

Decades and Current Trends gathers the advances made within the last 20 years by well-known experts in the area of theoretical and computational chemistry and physics. The title itself reflects the celebration of the twentieth anniversary of the “Conference on Current Trends in Computational Chemistry (CCTCC)” to which all authors have participated and contributed to its success. This volume poses (and answers) important questions of interest to the computational chemistry community and beyond. What is the historical background of the “Structural Chemistry”? Is there any way to avoid the problem of intruder state in the multi-reference formulation? What is the recent progress on multi-reference coupled cluster theory? Starting with a historical account of structural chemistry, the book focuses on the recent advances made in promising theories such as many body Brillouin-Wigner theory, multireference state-specific coupled cluster theory, relativistic effect in chemistry, linear and nonlinear optical properties of molecules, solution to Kohn-Sham problem, electronic structure of solid state materials, development of model core potential, quantum Monte Carlo method, nano and molecular electronics, dynamics of photodimerization and excited states, intermolecular interactions, hydrogen bonding and non-hydrogen bonding interactions, conformational flexibility, metal cations in zeolite catalyst and interaction of nucleic acid bases with minerals. Practical Aspects of

Computational Chemistry I: An Overview of the Last Two Decades and Current Trends is aimed at theoretical and computational chemists, physical chemists, materials scientists, and particularly those who are eager to apply computational chemistry methods to problem of chemical and physical importance. This book will provide valuable information to undergraduate, graduate, and PhD students as well as to established researchers.

The main goal of this book is to elucidate what kind of experiment must be performed in order to determine the full set of independent parameters which can be extracted and calculated from theory, where electrons, photons, atoms, ions, molecules, or molecular ions may serve as the interacting constituents of matter. The feasibility of such perfect' and-or `complete' experiments, providing the complete quantum mechanical knowledge of the process, is associated with the enormous potential of modern research techniques, both, in experiment and theory. It is even difficult to overestimate the role of theory in setting of the complete experiment, starting with the fact that an experiment can be complete only within a certain theoretical framework, and ending with the direct prescription of what, and in what conditions should be measured to make the experiment `complete'. The language of the related theory is the language of quantum mechanical amplitudes and their relative phases. This book captures the spirit of

research in the direction of the complete experiment in atomic and molecular physics, considering some of the basic quantum processes: scattering, Auger decay and photo-ionization. It includes a description of the experimental methods used to realize, step by step, the complete experiment up to the level of the amplitudes and phases. The corresponding arsenal includes, beyond determining the total cross section, the observation of angle and spin resolved quantities, photon polarization and correlation parameters, measurements applying coincidence techniques, preparing initially polarized targets, and even more sophisticated methods. The `complete' experiment is, until today, hardly to perform. Therefore, much attention is paid to the results of state-of-the-art experiments providing detailed information on the process, and their comparison to the related theoretical approaches, just to mention relativistic multi-configurational Dirac-Fock, convergent close-coupling, Breit-Pauli R-matrix, or relativistic distorted wave approaches, as well as Green's operator methods. This book has been written in honor of Herbert Walther and his major contribution to the field but even to stimulate advanced Bachelor and Master students by demonstrating that obviously nowadays atomic and molecular scattering physics yields and gives a much exciting appreciation for further advancing the field.

A keyword listing of serial titles currently received by the National Library of

Medicine.

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This book is devoted to a thorough investigation of the physics and applications of the vacuum arc – a highly-ionized metallic plasma source used in a number of applications – with emphasis on cathode spot phenomena and plasma formation. The goal is to understand the origins and behavior of the various complex and sometimes mysterious phenomena involved in arc formation, such as cathode spots, electrode vaporization, and near-electrode plasma formation. The book takes the reader from a model of dense cathode plasma based on charge-exchange ion-atom collisions through a kinetic approach to cathode vaporization and on to metal thermophysical properties of cathodes. This picture is further enhanced by an in-depth study of cathode jets and plasma acceleration, the effects of magnetic fields on cathode spot

behavior, and electrical characteristics of arcs and cathode spot dynamics. The book also describes applications to space propulsion, thin film deposition, laser plasma generation, and magnetohydrodynamics, making this comprehensive and up-to-date volume a valuable resource for researchers in academia and industry.

This volume continues the tradition of the Advances series. It contains contributions from experts in the field of atomic, molecular, and optical (AMO) physics. The articles contain some review material, but are intended to provide a comprehensive picture of recent important developments in AMO physics. Both theoretical and experimental articles are included in the volume. International experts Comprehensive articles New developments

Collective Light Emission: Many quantum emitters covers several recent and essential topics related to collective light emissions from many quantum emitters. Light-matter interactions in quantum systems form one of the complicated dynamical systems. Owing to its complexity, researchers have developed new means and techniques to investigate such systems with better control of parameters and better precision to observe interesting phenomenon. These advancements provide new insights to this research direction, and this book dives into the recent progress and future of it. The book includes the basic mechanism, well-known super- and sub-radiant phenomena in free space and nanophotonic platform, applications in quantum systems, and perspectives to future directions. Additionally, several updates of this ongoing research and challenges confronted in experiments and theories are included. Key Features A detailed introduction of recent progress of cooperative phenomena of light Stimulating deliberation on distinct features from light-induced atom-atom correlations New angle to the collective radiation Insights to quantum engineering of light Includes future prospective and

opportunities

The book "Fingerprints in the optical and transport properties of quantum dots" provides novel and efficient methods for the calculation and investigating of the optical and transport properties of quantum dot systems. This book is divided into two sections. In section 1 includes ten chapters where novel optical properties are discussed. In section 2 involve eight chapters that investigate and model the most important effects of transport and electronics properties of quantum dot systems This is a collaborative book sharing and providing fundamental research such as the one conducted in Physics, Chemistry, Material Science, with a base text that could serve as a reference in research by presenting up-to-date research work on the field of quantum dot systems.

This volume on Clusters brings together contributions from a large number of specialists. A central element for all contributions is the use of advanced computational methodologies and their application to various aspects of structure, reactivity and properties of clusters. The size of clusters varies from a few atoms to nanoparticles. Special emphasis is given to bringing forth new insights on the structure and properties of these systems with an eye towards potential applications in Materials Science. Overal, the volume presents to the readers an amazing wealth of new results. Particular subjects include water clusters, Silicon, Iron, Nickel and Gold clusters, carbon-titanium microclusters and nanoparticles, fullerenes, carbon nanotubes, chiral carbon nanotubes, boron nanoclusters and more.

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The book contains seven chapters written by noted experts and young researchers who present their recent studies of both pure mathematical problems of perturbation theories and application of perturbation methods to the study of the important topic in physics, for example, renormalization group theory and applications to basic models in theoretical physics (Y. Takashi), the quantum gravity and its detection and measurement (F. Bulnes), atom-photon interactions (E. G. Thrapsaniotis), treatment of spectra and radiation characteristics by relativistic perturbation theory (A. V. Glushkov et al), and Green's function theory and some applications (Jing Huang). The pure mathematical issues are related to the problem of generalization of the boundary layer function method for bisingularly perturbed differential equations (K. Alymkulov and D. A. Torsunov) and to the development of new homotopy asymptotic methods and some of their

applications (Baojian Hong).