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**Theory of Resonances** - V. I. Kukulin - 2013-06-29
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**Theory of Resonances - 1989**
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**Advanced Topics in Theoretical Chemical Physics** - Jean Maruani - 2020-11-30

**Advanced Topics in Theoretical Chemical Physics** is a collection of 20 selected papers from the scientific presentations of the Fourth Congress of the International Society for Theoretical Chemical Physics (ISTCP) held at Marly-le-Roi, France, in July 2002. Advanced Topics in Theoretical Chemical Physics encompasses a broad spectrum in which scientists place special emphasis on theoretical methods in chemistry and physics. The chapters in the book are divided into five sections: I. Advanced Chemical Thermodynamics; II. Electronic Structure of Molecular Systems; III. Molecular Interaction and Dynamics; IV. Condensed Matter; V. Playing with Numbers. This book is an invaluable resource for all academics and researchers interested in theoretical, quantum or statistical, chemical physics or physical chemistry. It presents a selection of some of the most advanced methods, results and insights in this exciting area.


This book brings together the essential ideas and methods behind applications of variational theory in theoretical physics and chemistry. The emphasis is on understanding physical and computational applications of variational methodology rather than on rigorous mathematical formalism. The text begins with an historical survey of familiar variational principles in classical mechanics and optimization theory. Then proceeds to develop the variational principles and formalism behind current computational methodology for bound and continuum quantum states of interest in physics and chemistry. Chapters are devoted to semiclassical methods in the study of resonances. The book ends with an introduction to the variational theory of relativistic fields. Ideal for graduate students and researchers in any field that uses variational methodology, this book is particularly suitable as a backup reference for lecture courses in mathematical methods in physics and theoretical chemistry.

**Mathematical Theory of Scattering Resonances** - Semyon Dyatlov - 2010-09-10

Scattering theory is the mathematical formulation of how energy can scatter to infinity. A typical resonance has a rate of oscillation (just as a bound state does) and a rate of decay. Although the notion is introduced here in the context of quantum mechanics, it applies in many different contexts: it is, for example, the resonance of Green's functions. The poles of these meromorphic continuations capture physical information by identifying the rate of oscillation with the real part of a pole and the rate of decay with its imaginary part. An example from mathematical physics is given by the Yukawa potential: the scattering resonances are Yukawa decay modes.


This book presents developments carried out over the years leading to algorithms that have been implemented in many-body quantum systems in nuclear and condensed matter physics. It provides access to the enormous literature on the subject in a form useful for students and teachers of nuclear and condensed matter physics. The book contains enough details for a beginner in nuclear physics to follow the formalism and theoretical results, and provides a valuable reference for the research literature. The authors include all the experts in this field including many world-leading scientists from China, Europe, Japan, and United States.Keywords: Covariant Density Functional Theory;Relativistic Mean-Field Theory;Collective Excitations;Small Amplitude Motion;Quasiparticle-Vibration Coupling;Beyond Mean-Field Approximation;Artificial Neural Networks;Neutron Star


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This book aims to provide a detailed introduction to the state-of-the-art covariant density functional theory, which follows the Lorentz invariance from the very beginning and is able to describe many-body quantum systems with non-Abelian and non-Abelian symmetries. Covariant density functional theories have been developed in the 1970s and have since been developed and used to describe the diversity of nuclear properties and the configurations of the atomic nuclei. The focus of this book is on the covariant density functional theory for graduate students and nuclear physics researchers, this book summarizes the enormous amount of developments in the covariant density functional theory over the last few decades as well as the latest developments in this area. Moreover, the book contains enough details for readers to follow the formalism and theoretical results, and provides exhaustive references to explore the research literature. The book presents an advanced development of covariant density functional theory that has accumulated in the field of covariant density functional theory over the last few decades as well as the latest developments in this area. Moreover, the book contains enough details for readers to follow the formalism and theoretical results, and provides exhaustive references to explore the research literature.

**Neutron Resonance Theory** - Robert K. Nesbet - 2002-11-14

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importantly, it does assume a seriousness of purpose and a modicum of mathematical sophistication. The book is intended to be used in one of several possible ways: (1) as a self-study guide; (2) as a textbook for a course in advanced linear algebra, either at the upper-class undergraduate level or at the first-year graduate level; or (3) as a reference book. The 2013 Workshop was co-organized by three physicists, the linear algebra of which the reader is assumed to have been exposed, at least informally, to some extent.

Quantum Theory from First Principles - Giorgio Mauro D'Ariano - 2017-02-09

Quantum theory is the theory of physical systems that can be described by wave functions. It is not just a theory of physical systems, but rather a framework with universal applicability. This book shows how we can reconstruct the theory from six fundamental postulates, and how the theory can be understood and assimilated with exceptional ease.

The book covers two domains: radiospectroscopy and quantum radioelectronics. Radiospectroscopy comprises nuclear magnetic resonance and related phenomena, while quantum radioelectronics comprises quantum information protocols from first principles. Using intuitive graphical notation to represent equations, and with shorter and more efficient derivations, the theory can be understood and assimilated with exceptional ease. The book contains an elementary presentation of many topics, including the multichannel, dimensionless ones and with time dependent potentials have been added. The first attempts in solving the three-body inverse problem are also mentioned.

Direct and Inverse Problems - Boris N. Zakharevich - 2012-12-06

This book is devoted to the description of the fundamental aspects of the quantum theory, which are often not immediately clear to all who need them. But fortunately, this is also followed by simplifications and unifications of our previous concepts. The inverse problem method ("How do we get from the quantum world to the real world?" as many will ask with these aspects. It is rather astonishing that it took 40 years after the foundation of quantum mechanics for the "Inverse" problem to be described in a self-contained manner! However, this book lays the foundation for the general theory which will be developed in future articles. The book introduces the general theory, including the general properties for sets in normed spaces, linear bounded operators on normed spaces, and compactness in normed spaces, and on the basic principles in Functional Analysis: the Hahn-Banach theorem, the Uniform Boundedness Principle, the Open Mapping and the Closed Graph theorems. The second one contains exercises on the general theory of Hilbert spaces, the Riesz representation theorem, orthogonality in Hilbert spaces, the projection theorem and linear bounded operators on Hilbert spaces. The third one deals with linear topological spaces, and includes a large number of exercises on the topological aspects.
exercises as possible. The eight chapters of this book contain a large number of problems and exercises, selected

Comprehensive Chemical Kinetics - Nicholas Green - 2015-11-21
Unimolecular and bimolecular reactions. This is a major topic which is new in this book. The first section of each
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