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Mikio Namiki

## Stochastic Quantization



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# Stochastic Quantization

**Vittorio De Alfaro**



## Stochastic Quantization:

*Stochastic Quantization* Mikio Namiki, 2008-10-04 This is a textbook on stochastic quantization which was originally proposed by G Parisi and Y S Wu in 1981 and then developed by many workers I assume that the reader has finished a standard course in quantum field theory The Parisi Wu stochastic quantization method gives quantum mechanics as the thermal equilibrium limit of a hypothetical stochastic process with respect to some fictitious time other than ordinary time We can consider this to be a third method of quantization remarkably different from the conventional theories i e the canonical and path integral ones Over the past ten years we have seen the technical merits of this method in quantizing gauge fields and in performing large numerical simulations which have never been obtained by the other methods I believe that the stochastic quantization method has the potential to extend the territory of quantum mechanics and of quantum field theory However I should remark that stochastic quantization is still under development through many mathematical improvements and physical applications and also that the fictitious time of the theory is only a mathematical tool for which we do not yet know its origin in the physical background For these reasons in this book I attempt to describe its theoretical formulation in detail as well as practical achievements

Stochastic Quantization Mikio Namiki, 2014-01-15

**Stochastic Quantization** Poul Henrik Damgaard, Helmuth H[un]ffel, 1988 This collection of selected reprints presents as broad a selection as possible emphasizing formal and numerical aspects of Stochastic Quantization It reviews and explains the most important concepts placing selected reprints and crucial papers into perspective and compact form

**Path Integral Quantization and Stochastic Quantization** Michio Masujima, 2008-11-21 In this book we discuss the path integral quantization and the stochastic quantization of classical mechanics and classical field theory For the description of the classical theory we have two methods one based on the Lagrangian formalism and the other based on the Hamiltonian formalism The Hamiltonian formalism is derived from the Lagrangian formalism In the standard formalism of quantum mechanics we usually make use of the Hamiltonian formalism This fact originates from the following circumstance which dates back to the birth of quantum mechanics The first formalism of quantum mechanics is Schrodinger's wave mechanics In this approach we regard the Hamilton Jacobi equation of analytical mechanics as the Eikonal equation of geometrical mechanics Based on the optical analogy we obtain the Schrodinger equation as a result of the inverse of the Eikonal approximation to the Hamilton Jacobi equation and thus we arrive at wave mechanics The second formalism of quantum mechanics is Heisenberg's matrix mechanics In this approach we arrive at the Heisenberg equation of motion from consideration of the consistency of the Ritz combination principle the Bohr quantization condition and the Fourier analysis of a physical quantity These two formalisms make up the Hamiltonian formalism of quantum mechanics

**Geometry, Topology and Quantization** P. Bandyopadhyay, 2013-03-07 This is a monograph on geometrical and topological features which arise in various quantization procedures Quantization schemes consider the feasibility of arriving at a quantum system from a classical one and these

involve three major procedures viz i geometric quantization ii Klauder quantization and iii stochastic quantization In geometric quantization we have to incorporate a hermitian line bundle to effectively generate the quantum Hamiltonian operator from a classical Hamiltonian Klauder quantization also takes into account the role of the connection one form along with coordinate independence In stochastic quantization as proposed by Nelson Schrodinger equation is derived from Brownian motion processes however we have difficulty in its relativistic generalization It has been pointed out by several authors that this may be circumvented by formulating a new geometry where Brownian motion processes are considered in external as well as in internal space and when the complexified space time is considered the usual path integral formulation is achieved When this internal space variable is considered as a direction vector introducing an anisotropy in the internal space we have the quantization of a Fermi field This helps us to formulate a stochastic phase space formalism when the internal extension can be treated as a gauge theoretic extension This suggests that massive fermions may be considered as Skyrme solitons The nonrelativistic quantum mechanics is achieved in the sharp point limit

*Path Integrals in Physics* M Chaichian, A Demichev, 2001-07-01 The path integral approach has proved extremely useful for the understanding of the most complex problems in quantum field theory cosmology and condensed matter physics Path Integrals in Physics Volume II Quantum Field Theory Statistical Physics and other Modern Applications covers the fundamentals of path integrals both the Wiener and Feynman types and their many applications in physics The book deals with systems that have an infinite number of degrees of freedom It discusses the general physical background and concepts of the path integral approach used followed by a detailed presentation of the most typical and important applications as well as problems with either their solutions or hints how to solve them Each chapter is self contained and can be considered as an independent textbook It provides a comprehensive detailed and systematic account of the subject suitable for both students and experienced researchers

**Stochastic Quantization Scheme of Parisi and Wu** S. Chaturvedi, A. K. Kapoor, V. Srinivasan, 1990

**Spatio-temporal Chaos and Vacuum Fluctuations of Quantized Fields** Christian Beck, 2002 This book deals with new applications for coupled map lattices in quantum field theories and elementary particle physics P xiii

**Quarks, Symmetries And Strings - A Symposium In Honor Of Bunji Sakita's 60th Birthday** Michio Kaku, Antal Jevicki, Keiji Kikkawa, 1991-04-30 Quarks Symmetries and Strings is a book that reflects the rich diversity of current research in physics it describes quantum chromodynamics quark phenomenology superstring theory supersymmetry matrix models statistical methods superconductivity and neural networks The book also reflects the diversity of Dr Bunji Sakita's scientific work Dr Sakita has made seminal contributions in many of these areas The book celebrates the many path breaking ideas he pioneered which still cross fertilize many of the most active areas of current research

*Low-Power Computer Vision* George K. Thiruvathukal, Yung-Hsiang Lu, Jaeyoun Kim, Yiran Chen, Bo Chen, 2022-02-22 Energy efficiency is critical for running computer vision on battery powered systems such as mobile phones or UAVs unmanned aerial vehicles or drones

This book collects the methods that have won the annual IEEE Low Power Computer Vision Challenges since 2015 The winners share their solutions and provide insight on how to improve the efficiency of machine learning systems     High Energy Physics Index ,1993     *Progress of Theoretical Physics and Supplement* ,1999     **International Conference on Digital Signal Processing Proceedings** ,2002     Stochastic Quantization and the Large N Reduction of Quantum Field Theories Jorge Alfaro,1983     **Topological Methods in Quantum Field Theories** ,1991     Classical and Quantum Gravity ,2001     *Mathematical Reviews* ,1996     **Applications of Field Theory to Statistical Mechanics** L. Garrido,1985     **Constrained Dynamics and Quantum Gravity 1996** Vittorio De Alfaro,Tullio Regge,1997  
*Constrained Dynamics and Quantum Gravity 1999* Vittorio De Alfaro,2000

## **Stochastic Quantization** Book Review: Unveiling the Power of Words

In a world driven by information and connectivity, the energy of words has become more evident than ever. They have the capability to inspire, provoke, and ignite change. Such may be the essence of the book **Stochastic Quantization**, a literary masterpiece that delves deep into the significance of words and their effect on our lives. Published by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we shall explore the book's key themes, examine its writing style, and analyze its overall effect on readers.

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