

Nuclear Forces: Introduction to Theoretical Nuclear Physics.

Quantum Monte Carlo methods for nuclear physics

J. Carlson
Theoretical Division,
Los Alamos National Laboratory, Los Alamos,
NM 87545

S. Gandolfi
Theoretical Division,
Los Alamos National Laboratory, Los Alamos,
NM 87545

F. Pederiva
Dipartimento di Fisica,
Università di Trento, I-38123 Trento,
Italy
INFN - Trento Institute for Fundamental Physics and Applications,
I-38123 Trento Italy

Steven C. Pieper
Physics Division,
Argonne National Laboratory, Argonne,
IL 60439

R. Schiavilla
Theory Center, Jefferson Lab, Newport News,
VA 23606
Department of Physics,
Old Dominion University, Norfolk,
VA 23529

K.E. Schmidt
Department of Physics,
Arizona State University, Tempe,
AZ 85287

R.B. Wiringa
Physics Division,
Argonne National Laboratory, Argonne,
IL 60439

Quantum Monte Carlo methods have proved very valuable to study the structure and reactions of light nuclei and nucleonic matter starting from realistic nuclear interactions and currents. These *ab-initio* calculations reproduce many low-lying states and transition moments in light nuclei, and simultaneously predict many properties of light nuclei and neutron matter over a rather wide range of energy and momenta. We review the nuclear interactions and currents, and describe the continuous Quantum Monte Carlo methods used in nuclear physics. These methods are similar to those used in condensed matter and electronic structure but naturally include spin-isospin, tensor, spin-orbit, and three-body interactions. We present a variety of results including the low-lying spectra of light nuclei, nuclear form factors, and transition matrix elements. We also describe low-energy scattering techniques, studies of the electroweak response of nuclei relevant in electron and neutrino scattering, and the properties of dense nucleonic matter as found in neutron stars. A coherent picture of nuclear structure and dynamics emerges based upon rather simple but realistic interactions and currents.

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and the weak nuclear force. A fully symmetric theory would also introduce magnetic charges. Nuclear Forces: Introduction to Theoretical Nuclear Physics Hardcover Jun by Gernot Eder (Author), I. Kaplan (Translator). Be the first to review this item. Research in nuclear physics is an integral part of the search for knowledge and . Recent theoretical progress in understanding nuclear forces suggests that the . ANNUAL REVIEW OF NUCLEAR AND PARTICLE SCIENCE VOL 44 ANN .. NUCLEAR FORCES INTRODUCTION TO THEORETICAL NUCLEAR. An introduction to Nuclear Physics for Physics majors. Topics include: Elements of Scattering Theory, Rutherford scattering, Energy loss due to ionization, Cerenkov radiation, Photoelectric effect, Thomson, The deuteron and nuclear forces.

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