



Philippe Andre Martin, Francois Rothen

# Many-Body Problems and Quantum Field Theory

An Introduction

Series: Theoretical and Mathematical Physics

- Carefully select the really important applications of quantum physics to the physics of matter and develop the theory just to the extent it is actually needed
- Pedagogically written and altogether quite different from most books on quantum physics

This text is a revised and augmented version of a course given to graduate and Ph.D. students in the context of the doctoral school for physics in the French-speaking part of Switzerland. This doctoral school provides a common teaching program for the universities of Bern, Fribourg, Geneva, Neuchatel and Lausanne, as well as for the Swiss Federal Institute of Technology in Lausanne. The scope of the course should be sufficiently general to interest both experimentalists and theoreticians wishing to engage in research in condensed matter or nuclear and particle physics. The prerequisites are an introductory course to quantum mechanics and elements of classical electromagnetism and statistical mechanics. Our main concern was how to maintain a reasonably broad level of knowledge for students with different orientations, in a world of research where the price of survival is extreme specialization and competitiveness. Is it still possible in the available time to provide a cultural education in physics by relatively elementary means and in an optimized form? We believe that this is an essential pedagogical duty. Attempting to meet this challenge has determined the conception of this book: each individual part of it is standard and without novelty but should belong, in our opinion, to the basic culture of every physicist; only their common organization in a single house of decent size might possibly be put to our credit.

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