

## PROBLEMS AND SOLUTIONS IN QUANTUM MECHANICS

This collection of solved problems corresponds to the standard topics covered in established undergraduate and graduate courses in quantum mechanics. Completely up-to-date problems are also included on topics of current interest that are absent from the existing literature.

Solutions are presented in considerable detail, to enable students to follow each step. The emphasis is on stressing the principles and methods used, allowing students to master new ways of thinking and problem-solving techniques. The problems themselves are longer than those usually encountered in textbooks and consist of a number of questions based around a central theme, highlighting properties and concepts of interest.

For undergraduate and graduate students, as well as those involved in teaching quantum mechanics, the book can be used as a supplementary text or as an independent self-study tool.

KYRIAKOS TAMVAKIS studied at the University of Athens and gained his Ph.D. at Brown University, Providence, Rhode Island, USA in 1978. Since then he has held several positions at CERN's Theory Division in Geneva, Switzerland. He has been Professor of Theoretical Physics at the University of Ioannina, Greece, since 1982.

Professor Tamvakis has published 90 articles on theoretical high-energy physics in various journals and has written two textbooks in Greek, on quantum mechanics and on classical electrodynamics. This book is based on more than 20 years' experience of teaching the subject.

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## Preface

This collection of quantum mechanics problems has grown out of many years of teaching the subject to undergraduate and graduate students. It is addressed to both student and teacher and is intended to be used as an auxiliary tool in class or in self-study. The emphasis is on stressing the principles, physical concepts and methods rather than supplying information for immediate use. The problems have been designed primarily for their educational value but they are also used to point out certain properties and concepts worthy of interest; an additional aim is to condition the student to the atmosphere of change that will be encountered in the course of a career. They are usually long and consist of a number of related questions around a central theme. Solutions are presented in sufficient detail to enable the reader to follow every step. The degree of difficulty presented by the problems varies. This approach requires an investment of time, effort and concentration by the student and aims at making him or her fit to deal with analogous problems in different situations. Although problems and exercises are without exception useful, a collection of solved problems can be truly advantageous to the prospective student only if it is treated as a learning tool towards mastering ways of thinking and techniques to be used in addressing new problems rather than a solutions manual. The problems cover most of the subjects that are traditionally covered in undergraduate and graduate courses. In addition to this, the collection includes a number of problems corresponding to recent developments as well as topics that are normally encountered at a more advanced level.