

Preface to the Greek Edition

As the title *History and Evolution of Concepts in Physics* indicates, this book essentially encompasses two different approaches of the same topic, which is the course of evolution of physics throughout history, from historical times to the present. The first approach, *History of Physics*, deals with people (great scientists, important inventors, etc.) and their activities, along with their personalities, their family and scientific environment, and the social framework of their era. Inevitably, the life and work of every great scientist occupies a separate chapter; if the scientist has contributed to several areas of physics, all contributions are discussed in the same chapter.

In doing so, however, one tends to lose the coherence of the *Evolution of Concepts in Physics*, which is the second approach. The reason is that, in every branch of physics, the concepts evolved at different paces over the years, depending on the available, at the time, experimental data (which, in turn, depend on the existing laboratory instruments and their precision) and mathematical tools (which, in turn, depend on the stage of development of the mathematical arsenal). For instance, the topics of mechanics and gravitation were feasible targets for Newton to attempt the development of the corresponding theories, while optics was not, since the latter required more advanced experimental concepts (e.g., diffraction and polarization), more advanced mathematics (e.g., complex functions), and longer time span for those concepts to attain a certain level of maturity. As a result, concepts in every branch of physics evolved at different paces following different routes, a fact suggesting that it may be better to present each topic separately. This approach alone, however, could compromise the unity of the presentation, since the work of every great scientist would have appeared fragmented in the various chapters of the book.

It is obvious that these two different approaches for presenting an account of the evolution of physics over the centuries have, each, advantages as well as weaknesses. In this book, I tried to reconcile the two different approaches; I give emphasis on the evolution of concepts, including, at the same time, several historical notes for every scientist, in an attempt to present his work and personality within the framework of his era. Hopefully, the final result will help the reader to understand the way physics evolved to the present day.

I would like to thank all those who helped in improving the book, pointing out mistakes, oversights, and ambiguities in the draft. These are, in alphabetical order, Profs. B. Charmandaris, K. Melidis, S. Persidis, N. Spyrou, and A. Varvoglis. I would also like to thank my colleagues Profs. E. Meleziadou-Dompoula and J. Touloumakos, for their help in the paragraph regarding the Museum of Alexandria, as well as the text editor of the Greek edition and my former student, S. Oikonomidis, for his useful remarks that helped improve the book.

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Preface to the English Edition

The translation of the Greek original in English was performed while I was a visiting professor in the *Theoretical Astrophysics Section* of the Institute for Astronomy and Astrophysics of the Eberhard Karls University of Tübingen during spring 2012. I would like to thank for the hospitality Prof. K. Kokkotas. The English version of the book benefited from the suggestions by Prof. J. Teichmann and an anonymous referee. I would like to thank Ch. Varvogli for her help in drawing Figs. 2.2 , 2.3, 4.2, and 4.10, S. Kartsaklis of Klidarithmos Publishing for his help in drawing Figs. 4.8, 4.11, and 5.1, and Prof. V. Tsamakda for providing Fig. 7.1 Above all, I would like to thank M. Mikedis of Klidarithmos Publishing for editing the final version of the book and Dr. Angela Lahee for her help since the first submission of the manuscript to Springer.

I would be glad to provide, free of charge, to anyone interested a full set of electronic slides covering the content of the book—suitable for approximately thirty 45m lectures.

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