

## Preface to the Third Edition

For more than 20 years now the Wiley-VCH Encyclopedia of Physics has been recognized as one of the leading international encyclopedias in physics. Worldwide, this work has served the continued reference needs of scientists, students, librarians, and the general public interested in modern physics. With this third, completely revised, updated and enlarged edition of the Encyclopedia, the publisher intends to meet the demand for current, precise information on both classical and recent concepts in physics. The Encyclopedia is intended to be the starting point for everybody who either works in or studies physics, in particular for everyone who looks for information on subjects outside her or his field of expertise.

In their preface to the previous edition of this Encyclopedia, the editors Rita G. Lerner and George L. Trigg emphasized that this Encyclopedia “describes physics only as of a particular moment in time”. In the almost two decades since the first edition appeared, there have been significant changes in many areas of physics.

In recent years, scientific research has been driven predominantly by the approach to nanometer scale systems and devices. Scanning probe microscopy was a pre-requisite for our present knowledge of the structure and dynamics of surfaces and interfaces on an atomic scale. The experimental realization of the trapping and cooling of neutral atoms attracted wide interest among the scientific community and was the starting point for a new branch of physics. As a consequence of this development, for example, the first experimental evidence of Bose–Einstein condensation was achieved. Possible approaches for the realization of quantum entanglement and quantum computation have been realized at the border between the physics of the twentieth century and the present decade. Among others, these results of modern basic research in physics will possibly have an impact on future developments in technology and science. The present development in physics, as well as in other scientific and technical disciplines, requires more and more knowledge of other, adjacent areas of modern research. This tendency is reflected in particular by the interdisciplinary approach of a number of novel and further ‘booming’ subject areas such as biophysics or econophysics.

All of the more than 500 articles on the most important areas of physics in this Encyclopedia have been written or revised by renowned authorities in science and physical technology. A number of new entries have been included to cover the most recent terminology and techniques in physics. As in the previous editions, articles are arranged in alphabetical order. At the end of most articles, cross-references are given to related articles in this work. Since it was not our intention to further expand the size of this volume and to leave the concept of a concise, easy-to-access approach to modern physics behind, most authors have provided references for further reading. These bibliographies have been completely updated for the existing articles.

The publisher is grateful to the many scientific colleagues and friends who have cooperated and contributed to this new edition and thanks them for their suggestions and comments.

*Alexander Grossmann  
Editorial Director Wiley-VCH*