
Preface

The writing of this book has of course been stimulated by the exciting developments in the field of Bose-Einstein Condensation (BEC) for atomic gases that have manifested since the 1995 experiments. These experiments are showing brand new features never before observed. Their theoretical analysis and understanding is however still based on the standard theory of Bose-Einstein condensation developed for space-homogeneous boson systems. Just as importantly are the recent exact results and new views on the problem of many-body physics developed during the last fifty years. Of course, many of these results have their own particular impact on the problem of BEC for boson systems. Moreover many of them seem to be only known by a small number of mathematical physicists but are less known by the larger community of physicists.

Faced with this situation, this book is conceived to be an introduction to these new concepts and results written with considerable attention toward the physical ideas behind the more technical material. Apart from the study of general and universal properties of fully interacting boson systems, numerous homogeneous boson models are explicitly treated. The applications of the presented material to systems of trapped bosons is only briefly discussed and treated as a posed problem in Chap. 4. Further study is left to the care of the interested reader.

Much of the material mentioned in the text was obtained during many years of collaborations with many colleagues and former students. Warm thanks to all of them. We feel obliged to point out one colleague in particular, Mark Fannes. Thank you, Mark, for our long standing collaborations and continuing exchanges about views, ideas, and techniques along all these years during which we constructed together much of the backbone of the present text.

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