Preface

This book is essentially based on the lecture course on "Statistical Physics", which was taught by the author at the physical faculty of the Ural State University in Ekaterinburg since 1992. This course was intended for all physics students, not especially for those specializing in theoretical physics. In this sense the material presented here contains the necessary minimum of knowledge of statistical physics (also often called statistical mechanics), which is in author's opinion necessary for every person wishing to obtain a general education in the field of physics. This posed the rather difficult problem of the choice of material and compact enough presentation. At the same time it necessarily should contain all the basic principles of statistical physics, as well as its main applications to different physical problems, mainly from the field of the theory of condensed matter. Extended version of these lectures were published in Russian in 2003. For the present English edition, some of the material was rewritten and several new sections and paragraphs were added, bringing contents more up to date and adding more discussion on some more difficult cases. Of course, the author was much influenced by several classical books on statistical physics [1, 2, 3], and this influence is obvious in many parts of the text. However, the choice of material and the form of presentation is essentially his own. Still, most attention is devoted to rather traditional problems and models of statistical physics. One of the few exceptions is an attempt to present an elementary and short introduction to the modern quantum theoretical methods of statistical physics at the end of the book. Also, a little bit more attention than usual is given to the problems of nonequilibrium statistical mechanics. Some of the more special paragraphs, of more interest to future theorists, are denoted by asterisks or moved to Appendices. Of course, this book is too short to give a complete presentation of modern statistical physics. Those interested in further developments should address more fundamental monographs and modern physical literature.

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