

Preface to the Third Edition

At the time when the second edition of this book was published the study of the liquid state was a rapidly expanding field of research. In the twenty years since then, the subject has matured both theoretically and experimentally to a point where a real understanding exists of the behaviour of “simple” liquids at the microscopic level. Although there has been a shift in emphasis towards more complex systems, there remains in our view a place for a book that deals with the principles of liquid-state theory, covering both statics and dynamics. Thus, in preparing a third edition, we have resisted the temptation to broaden too far the scope of the book, and the focus remains firmly on simple systems, though many of the methods we describe continue to find a wider range of application. Nonetheless, some reorganisation of the book has been required in order to give proper weight to more recent developments. The most obvious change is in the space devoted to the theory of inhomogeneous fluids, an area in which considerable progress has been made since 1986. Other major additions are sections on the properties of supercooled liquids, which include a discussion of the mode-coupling theory of the kinetic glass transition, on theories of condensation and freezing and on the electric double layer. To make way for this and other new material, some sections from the second edition have either been reduced in length or omitted altogether. In particular, we no longer see a need to include a complete chapter on molecular simulation, the publication of several excellent texts on the subject having filled what was previously a serious gap in the literature. Our aim has been to emphasise what seems to us to be work of lasting interest. Such judgements are inevitably somewhat subjective and, as before, the choice of topics is coloured by our own experience and tastes. We make no attempt to provide an exhaustive list of references, limiting ourselves to what we consider to be the fundamental papers in different areas, along with selected applications.

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