Preface to the Imperial College Press edition.

A lot has happened in the field of condensed matter physics since the original edition of "Green's functions for Solid State Physicists" was published in 1974. Nevertheless, the book has helped introduce several generations of condensed matter physics graduate students to the very powerful ideas of quantum many body theory and some of their applications, particularly those in the physics of itinerant magnetism and superconductivity that have nowadays come to be called "the correlated electron problem".

In preparing for the reprint edition, two new chapters have been added to the original text to provide an introduction to the recent developments in this branch of condensed matter physics. Chapter 11 focuses on the understanding of the Kondo problem which grew out of the exact solutions developed in the mid 1970's. The accompanying growth of experimental work culminating in the discovery of the heavy fermion superconductors gave substance to the idea that Coulomb repulsion between electrons in a narrow band metal can actually lead to attraction between the electrons and resulting instabilities at low temperatures to either a superconducting or an antiferromagnetic state.

Then in 1986, the discovery by Bednorz and Mueller of high T_c superconductivity in the cuprate compounds provided a bombshell in the field of correlated electron systems. For the first time it was possible to have materials in a superconducting state at temperatures well above that of liquid nitrogen. Nevertheless, in spite of more than 10 years of very intensive research by physicists in many countries, the mechanism of high T_c superconductivity remains a mystery at the fundamental level. Chapter 12 offers an introduction to some of the basic theoretical ideas of the physics of the cuprate compounds.

Although the theoretical concepts leading to the understanding of superconductivity, which resulted from the fundamental work of Bardeen, Cooper and Schrieffer in the 1950's, still provide some of the theoretical underpinnings for high T_c , there are still many aspects of the properties of these materials which do not fit in with the elementary quasiparticle ideas of Fermi liquid theory. Consequently it has become clear that new physical concepts need to be developed to explain these properties. A brief introduction to the physics of one-dimensional metals is included

at the end of chapter 11 to serve as a basis for some of the new ideas in the physics of two-dimensional metals which may be applicable to high T_c. Their application in two dimensions is briefly introduced at the end of chapter 12.

The final chapter on understanding high T_c cannot be written at this time. Nevertheless it is our hope that this reprint edition, with the new material, will serve as an introduction and stimulus to the next generation of condensed matter physicists who seek to work on this challenging class of problems.

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