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QUARKS, GLUONS
AND LATTICES

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QUARKS, GLUONS AND LATTICES

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Preface

The last few years have seen a dramatic upsurge in interdisciplinary activity between solid state and particle physics. This arose primarily through the use of lattice cutoffs to study non-perturbative phenomena in the gauge theory of the strong interactions. However, the standard textbook treatments of field theory rely on more traditional perturbative techniques. This book is an attempt to introduce lattice techniques to the particle physicist with a basic background in relativistic quantum mechanics. This work is not intended to be a review of the latest developments, which are rapidly evolving, but rather an exposition of some of the more established methods.

The presentation is in the framework of particle physics. Solid state physicists may be interested in why high energy theorists are borrowing many of their ideas, but they should not expect this book to address subjects primarily of interest to their field. Thus important topics such as two-dimensional spin models, critical exponents, and fixed point phenomenology are only superficially mentioned.

I am grateful to the International School for Advanced Study in Trieste, Italy, and to my colleagues at Brookhaven for the opportunity to present series of lectures based on portions of this book.