Preface to the Second Edition

In the twenty years since the first edition, the promise of the Standard Model of Particle Physics has been fulfilled. The detailed behavior of the W and Z bosons did conform to expectations. The sixth quark finally arrived. The pattern of CP violation in B mesons fit convincingly the predictions based on the Kobayashi–Maskawa model. These three developments require three new chapters. The big surprise was the observation of neutrino oscillations. Neutrino masses and oscillations were not required by the Standard Model but are easily accommodated within it. An extensive fourth new chapter covers this history.

Though the neutrino story is not yet fully known, the basics of the Standard Model are all in place and so this is an appropriate time to update the Experimental Foundations of Particle Physics. We fully anticipate that the most exciting times in particle physics lie just ahead with the opening of the Large Hadron Collider at CERN. This Second Edition provides a recapitulation of some 75 years of discovery in anticipation of even more profound revelations.

Not only physics has changed, but technology, too. The bound journals we dragged to the xerox machine are now available from the internet with a few keystrokes on a laptop. Nonetheless, we have chosen to stick with our original format of text alternating with reprinted articles, believing Gutenberg will survive Gates and that there is still great value in having the physical text in your hands.

Choosing articles to reprint has become more difficult with the proliferation of experiments aimed at the most promising measurements. In some cases we have been forced to make an arbitrary selection from competing experiments with comparable results.

We would like to acknowledge again the physicists whose papers we reprint here. We have benefited from the advice of many colleagues for this Second Edition and would like to mention, in particular, Stuart Freedman, Fred Gilman, Dave Jackson, Zoltan Ligeti, Kerstin Tackmann, Frank Tackmann, George Trilling, and Stan Wojcicki.

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Berkeley, California, 2008

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