Preface

The first edition of this text appeared in 1994. Shortly after the third printing, our editor suggested that we attempt a second edition because new developments in stellar structure and evolution had made our original work outdated. We (the original authors, CJH and SDK) reluctantly agreed but with reservations due to the effort involved. Our initial reluctance disappeared when we were able to convince (cajole, twist the arm of, etc.) our new coauthor-colleague Virginia Trimble to join us. (Welcome Virginia!) We (i.e., all three of us) hope that you agree that the present edition is a great improvement compared to the 1994 effort.

Our objectives in this edition are the same ones we set forth in 1994:

What you will find is a text designed for our target audience: the typical senior undergraduate or beginning graduate student in astronomy or astrophysics who wishes an overview of stellar structure and evolution with just enough detail to understand the general picture. She or he can go on from there to more specialized texts or directly to the research literature depending on talent and interests. To this end, this text presents the basic physical principles without chasing all the (interesting!) details.

For those of you familiar with the first edition, you will find that some things have not been changed substantially ($F = ma$ is still $F = ma$), while others definitely have. For example, Chapter 2 has been completely rewritten. In many respects this chapter is the key to the text because it gives an extensive overview of the subject. The next eight chapters rely on the student’s having absorbed large parts of Chapter 2, though complete understanding is not necessary. Many students may wish to start with Chapter 2, although we recommend at least a once-through of Chapter 1, which contains some fundamental material. And, in response to many requests, there is substantially more observational material.

We have also attempted to improve on the graphics and have included more than we did in the first edition. In addition, the instructor will find many more “Exercises” at the end of chapters. They are a mixed bag (easy, moderate, difficult) but we hope they illuminate much of what we have to say. (Chapter 2 has more than its share; and, in fact, Chapters 1 and 2, plus exercises, could be the basis of a mini-course.)
Also new is the inclusion on the inside back cover of a CD-ROM containing computer programs that make decent “zero-age main sequence” stellar models and analyse those models for “pulsations” (radial and nonradial), and stellar evolution codes everyone can play with. All are in FORTRAN and should work on most computer platforms. Some of these codes are of our doing and we thank Andy Odell and Dean Pesnell (Nomad Research) for their generous contributions. As an additional bonus we have included portions of a colorful and informative Stellar Evolution Tutorial put together by John Lattanzio and his colleagues (as part of a commercial enterprise called Cantanout Ltd.). See the README files on the CD-ROM for more information on the programs and tutorial.

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The text was set in \LaTeX\ by the authors.

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