Preface

This book is intended primarily for graduate students and postdocs interested in academic careers in science and engineering. It should also be of interest to college juniors or seniors considering graduate school in one of these fields. In addition, I hope professional scientists and engineers in government and industry who are contemplating a return to academia as professors will profit from the material. The book should also be of benefit to beginning faculty, and to all faculty and administrators in a position to encourage and support those interested in becoming professors.

Schools of science and engineering produce a number of “products” of value to society. The first is graduates at the bachelor’s, master’s, and, in certain cases, doctoral level. The second is courses that can be taken in one form or another by industry employees. The third is all forms of scholarship including basic research, the integration and application of knowledge, and the development of new courses and methods of instruction. The key to all three of these products is a fourth product, professors, whom we want to be well prepared, highly motivated, and strongly supported.

There are approximately 1500 four-year institutions of higher education in the United States and Canada. Virtually all new faculty hires at these institutions, particularly at the assistant professorship level, have doctorate degrees. Of these 1500 institutions, approximately 250, or 17%, offer doctorates in one or more fields of science or engineering. These schools also employ approximately 55% of the total number of professors at four-year institutions. Thus, while the “producers” of Ph.D.s are also the “buyers” of Ph.D.s, the remaining 1250 schools also hire a significant number of Ph.D.s as professors. Of these schools, approximately 700 grant both bachelor’s and master’s degrees, while approximately 550 are liberal arts schools primarily offering four-year degrees.

This book represents a new way to help individuals prepare for, find, and succeed at careers as science or engineering professors. It derives from a course I teach at Stanford University. It also builds on my background as an engineer in industry and as a director of a nonprofit scientific and educational society. It
further profits from my experiences as a college professor, career counselor, associate dean, and executive director of two Stanford University research centers with extensive relationships among graduate students, faculty, government, and industry.

I have taught at a variety of schools in the United States and Canada, including community colleges, institutions offering bachelor’s and master’s degrees, and those schools with a strong emphasis on research and the granting of doctorate degrees. Yet, as I began writing this book, it became obvious to me that I needed further information about both the schools students attended for their doctorates, as well as the other nondoctorate-granting institutions where many wished to go to pursue an academic career.

As a consequence, I identified as sources of more in-depth information seven sample schools in the United States and Canada covering the spectrum of institutions of interest to most future science and engineering professors. These schools are representative of the four major categories of four-year institutions defined by the Carnegie Foundation for the Advancement of Teaching. The schools and their classifications are: Bucknell University in Lewisburg, PA (Private Baccalaureate), Memorial University of Newfoundland in St. John’s, Nfld. (Public Doctorate), the University of Michigan in Ann Arbor, MI (Public Research), the Rochester Institute of Technology in Rochester, NY (Private Master’s), San Jose State University in San Jose, CA (Public Master’s), Stanford University in Stanford, CA (Private Research), and the University of New Orleans in New Orleans, LA (Public Doctorate).

During a three-year period, I also talked at length with over 70 faculty, graduate students, and postdocs at some 20 additional institutions in all fields of science and engineering. Their comments and insights have proved invaluable. Indeed, quotes from most of these individuals appear in the pages that follow. Thirty of them are also the subjects of the vignettes appearing throughout the book.