rector of two university–industry consortiums at Stanford University. The book is aimed at graduate students and postdocs interested in academic careers. It is comprehensive and deals with every aspect of the academic community, from the academic enterprise through the preparation processes in research and teaching to the identification and acquisition of an academic appointment. A good part of the book is based on material provided by 70 faculty members, graduate students and postdoctoral fellows from a number of major research universities and masters and undergraduate institutions.

A strength and weakness of the book is its comprehensive nature. Almost anything you want to know about academia is covered. However, it is almost too much to comprehend and digest. No graduate student or postdoc could possibly take all the good advice given and still have time to complete a thesis as well as have a life beyond the job search. It would therefore be useful for the reader to use the book as a reference for specific areas of concern, such as how to write grants or learn how to teach.

While each of the book's 15 chapters has a brief introduction and summary, too often much of the chapter consists of quotes and opinions of a vast number of scientists and academics. This makes the reading rather choppy and insufficiently focused. The appendices do not contribute much. (While not actively looking for errors, I did notice that the address listed for the American Physical Society was the old location in New York City.)

In the final chapter, "Insights on Academia: Needed Changes," Reis's suggestions are too mild and do not present action-oriented strategies for ensuring that even the modest changes he advocates can or will be implemented. Graduate students interested in a career in research would be better off starting with the short but sharply focused *A PhD is Not Enough*, by Peter J. Feibelman (Addison-Wesley, 1993).

Career Renewal was coauthored by the husband–wife team of Stephen Rosen and Celia Paul. Rosen is a theoretical physicist who founded the nonprofit program Scientific Career Transitions to assist and guide professional scientists at all levels, from graduate students through seasoned professionals, from first jobs to mid-career changes. Paul runs a career-management firm for attorneys, business executives and physicians. Of the three books, this one is the most professional, in that it makes use of tried career-planning techniques and, where appropriate, modifies them for the special case of professional scientists. The book is divided into three main sections: A brief introductory section on career transformation, an assessment section and a 17-chapter section, entitled "Renewal," takes up most of the book.

Many vignettes and case studies of scientists and their career-transition experiences are included, but there are too many examples of exceptionally accomplished scientists. The book is fairly comprehensive and includes good references. A weak point is its division into only three main sections. It would have been better to subdivide the more than 200 pages of section 3 into shorter sections with better headers for easier cross referencing. Many of the chapters throughout the book include exercises on such topics as life choices, personal values, experiences and accomplishments, career evaluation, career options and so on. A trained councilor who could act as a motivator to insure that the reader would take the time to fill out all the exercises might be a useful addition.

Rosen and Paul devote part of a chapter to the stress related to career transitions and warn the reader to be aware of the possibility of related psychological depression. Far too few of the career advice guides, or talks at professional meetings, realistically take into account the psychological stress and possible depression associated with career transitions. The book has very strong appendices with well-annotated guides to other material, including books, references, software, Web sites, recruiters and more.

My recommendation: *To Boldly Go*—a personal copy for each job seeker; *Career Renewal*—a reference copy in every department library; and *Tomorrow's Professor*—a copy for the general library.

Tools of Radio Astronomy

Kristen Rohlfs and Thomas L. Wilson
Springer-Verlag, New York, 1996 [1986]. 2nd ed. 423 pp.
$69.50 hc ISBN 3-540-60981-4

An Introduction to Radio Astronomy

Bernard F. Burke and Francis Graham-Smith
Cambridge U. P., New York, 1997. 297 pp. $69.95 hc ($29.95 pb)
ISBN 0-521-55454-3 hc
(0-521-55604-X pb)

Kristen Rohlfs and Thomas L. Wilson's *Tools of Radio Astronomy*, now in its second edition, is an advanced-level textbook in the classical style. The library here at the University of California, Berkeley, has three well-used copies of the first edition. People use this book so much because it describes what one needs in order actually to do radio astronomy. The authors begin each topic with basic physics, usually Maxwell's equations, and then develop it to familiarize the reader with research telescopes and the current literature, including the jargon. The first half of the text covers instrumentation and techniques. The second covers most of the principal areas of astronomical research, emphasizing the fundamentals instead of the most recent results, and it will remain relevant for a long time.

The field has advanced in the ten years since the first edition, and all of the new or revised sections are outstanding. But even without this new material, the second edition is a big improvement. The organization is better and more logical. The English is more accessible, the discussions less formal and consequently less intimidating. With all this, the book is 30% larger; the extra pages are put to good use.

But the book isn't perfect. A major weakness is in topical coverage: There's a nice discussion of techniques for pulsar observing but no discussion of pulsar physics, nor do the authors even hint at interstellar or interplanetary scintillation. More generally, some of the treatments remain a bit formal, and some of the approaches to derivations are obscure; they could have been made much more user friendly by the insertion of a few sentences of explanation at the beginning. There are no problems for the reader to work out. (Wilson, one of the authors, has generated a set of problems that is available from him for a nominal charge.)

This book is an excellent graduate-level text—the best available by far. It is also the best reference book for the practicing astronomer who wants to do radio astronomy properly, to interpret the jargon or to understand some of the details of current literature.

Two grand masters with insight, perspective and detailed knowledge, Bernard F. Burke and Francis Graham-Smith, have filled their sweeping *An Introduction to Radio Astronomy* with interesting tidbits and intricate interconnections. Their general approach is to outline the big picture in enough detail to snare the reader's interest and then provide enough references for the details. They are at their best in the book's first half, which treats the fundamentals of measurement theory and technique. The second half covers the current status of

the major research areas in radio astronomy, but astronomy is a fast-moving field, and much of this material is already dated.

There are some awfully good parts to Burke and Graham-Smith's text: aperture distributions and beam pattern of telescopes; theory of interferometry; continuum and maser emission from stars; radio galaxies, quasars and the accretion disk model; and gravitational lensing. By and large, these are areas in which the authors or their colleagues have been personally involved, and it shows.

However, other aspects of the book are disappointing. The coverage is very spotty, with some very important areas receiving little real attention and others receiving too much. Most surprising to me was the treatment of the Galactic center. This is largely the domain of radio astronomy and is the nearest example we have to the hugely more powerful nuclei that power the quasars and radio galaxies that the authors treat so well. But with only one page of text (and five figures!), it is sadly glossed over.

Many of the figures and results are poorly selected and/or out of date. Emphasizing the historical development at some level has great merit, but I think the authors go too far. For example, they include the original (~35-year-old) 21 cm line map of Galactic spiral arms and state that this representation has not been improved upon. However, it certainly has, and perhaps the current best model is developed in a paper on the Galactic electron distribution that they quote extensively elsewhere in the book. Many figures are taken directly from sources in the literature, but without enough description; either more text or a modified figure would have helped a lot. The book is full of undefined and poorly defined jargon. The last chapter presents the broadest of broad summaries and a speculative look ahead, but it seems as though its predictions were made years ago because some, such as adaptive optics, have already been fulfilled.

These days, one can hardly even think about radio astronomy without worrying about interference generated by civilization's transmitters. Rohlfs and Wilson ignore this all-important topic. Burke and Graham-Smith end their book with a significant section on interference and frequency protection and, amazingly to me, end on an optimistic note that emphasizes the protected frequency bands. Practicing radio astronomers know full well that a protected band is no guarantee!

The fact is that we need to develop methods to observe through the interference. The new Green Bank Telescope, with its unobstructed aperture, is one possible way to deal with this problem, and I was disappointed to find no mention of this important aspect in either book. Just now being considered are the development of electronics, techniques and software that make interference reduction or excision possible to at least some degree. In one highly ironic endgame, terrestrial interference may force radio astronomers—who have traditionally been more hands on than most other astronomers—to operate remotely, in the most hands-off fashion possible, from the back side of the Moon.

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The Theory of Superconductivity in the High-T_c Cuprates

Philip W. Anderson
Princeton U. P., Princeton, N.J., 1997. 446 pp. $49.50 hc
ISBN 0-691-04365-5

How do I begin to write *the* review of Philip W. Anderson's *The Theory of Superconductivity in the High-*T_c *Cuprates*? This is the question I asked myself as the deadline for this review first fast approached and then receded even faster. I thought this must be writer's block, which I would eventually get over, but the truth is that this is an unusual book to review and I will never be able to write *the* review; instead I must settle for writing just *a* review of the book.

The extraordinary nature of Anderson's book and the issues raised in it and by it demand a different approach to reviewing. I will catalog my review along the lines of my favorite Clint Eastwood western, *The Good, The Bad, and the Ugly*.

The Good: This book has long been expected, and it is a significant contribution to our understanding of one of the great problems in condensed matter physics. What's more, it is written by one of the most important physicists of the second half of this century. Our understanding of the theory of metals, magnetism and superconductivity has been profoundly influenced by Anderson. With this as the backdrop, the book's rebellious tone, beseeching us to overturn the Fermi liquid theory of metals introduced by Lev Davidovich Landau and promulgated by the Russian heroes and a cast of thousands, is most striking and must be taken seriously.

I know that the tone and content of Anderson's book will annoy many of the researchers working on high-T_c superconductivity. This, however, is what makes it stand out over and above much of the work written to date on this subject. The intense efforts by the condensed-matter community to understand the normal state, from both the theoretical and experimental sides, would not have been as intense if Anderson did not insist on overthrowing the Fermi liquid theory of metals. This is also the case with regard to the Hubbard model and its derivatives. The extensive study of this model was spurred on in large part by Anderson, and his thoughts on this topic, discussed in some detail in the book, are deep and insightful. The extensive discussions on diverse experimental topics, such as photoemission, resistivity and the Hall angle, bring out Anderson's unique ability to see through the morass of details and find the grain of truth that connects these experiments.

The Bad: The book could have used a more thorough editing. For example, like everyone else working in the field, I went straight to the author index to see if my name was there. It wasn't. I looked further to see who else was (or wasn't) there. I would like to know, who is L. M. Varma? Also where can I find E. Teller's contribution? It is certainly not on page 423, as the index states.

Looking next at the text, I began to wonder if "Landon's expression" for the penetration depth, given on page 125, was discovered before London discovered it, and if so, why haven't I heard of him? There are several such errors that should have been caught in the editing process.

I also found it a bit disturbing that, when I would get deeply into a particular argument Anderson was developing, an annoying little letter would show up in the margin. Invariably, this was a note to let the reader know that the author had rejected that idea. I think it is good to see how a great mind operates, but the text would have been easier to follow if the currently accepted thoughts were presented in the main body, with the historical evolution of the ideas given in the footnotes.

The Ugly: Anderson has very strong views about certain theoretical approaches to high-T_c superconductivity, and some of his points are well taken. However, I think it is inappropriate to criticize a researcher without mentioning his or her name. Two of the people who have contributed significantly to the field and receive little or no mention are Douglas Scalapino and David Pines. Another ugly issue is the chapter on central dogmas. I hate to be dogmatic, but I don't think the field is sufficiently developed that we can support without question cen-