

BOOKS

On Tooling Up and Retooling For Today's Career Marketplace

To Boldly Go: A Practical Career Guide for Scientists

▶ Peter S. Fiske
*American Geophysical Union,
Washington, DC, 1996. 188 pp.
\$19.00 pb ISBN 0-87590-889-6*

Tomorrow's Professor: Preparing for Academic Careers in Science and Engineering

▶ Richard M. Reis
*IEEE, New York, 1997. 416 pp.
\$39.95 pb ISBN 0-7803-1136-1*

Career Renewal: Tools for Scientists and Technical Professionals

▶ Stephen Rosen and Celia Paul
*Academic, San Diego, Calif.,
1998. 352 pp. \$24.95 pb
ISBN 0-12-597060-9*

Reviewed by Brian B. Schwartz

For the second time in 25 years, graduating PhD scientists are facing a tight and changing job market. In the early 1970s, the job crunch was caused by the rather sudden cut-off in the growth of funding created by the demands of the Vietnam War and its distortion of the US economy. This was exacerbated by the simultaneous, nearly exponential rise in the number of graduating science PhDs who had responded to the impulse provided by Sputnik in the late 1950s. While many of the roots of the current job crisis, and some of the available responses, are different, what is most striking is that the range of alternative job opportunities is now

much greater and more varied.

It is a given that the current demand for traditional PhD research scientists in academia, government laboratories and industrial research laboratories is shrinking and undergoing potentially permanent structural change. Academic employment is tight and, in many instances, retiring academic physicists are not being replaced on a one-to-one basis. The nation's Federal laboratories have all had reductions in personnel, and with the end of the cold war many are experiencing uncertainties with respect to their mission. With global competition and the shortened development time to market it is imposing, the basic research programs of even the most accomplished industrial laboratories have been sharply reduced.

The job opportunities for PhD scientists and engineers in the US and throughout the world have expanded greatly beyond the confines of traditional academic and basic research. In the 1970s crisis, there was a substantial talent mismatch with the marketplace and PhDs were indeed driving taxis. In the 1990s, the transferable skills of versatile PhDs have found significant markets in such new areas as finance, banking, the Internet and the World Wide Web, multimedia and software development and management consulting. From just a trickle of PhDs going into these areas in the early 1990s, one now finds significant networks of successful path breakers and more employers willing to consider PhDs in these newer areas of nontraditional employment.

Much of academia has failed to confront the times; thoughtless statements still abound, such as: "The best and brightest still get good jobs," or, "In my day, we weren't all interested in employment." Some university departments have taken initial actions, but in most cases academia has not taught its students the new dance steps while economic forces increasingly call the tune. The response of the professional societies has been somewhat better: There are seminars and mini-career programs at professional meetings and internal literature and databases on career and job opportunities are being developed.

But the major new responses to the

current job crisis have been those of the students in helping themselves, in their use of such newer search and informational techniques as the Internet and the World Wide Web, and in the number of books aimed specifically at laying out the career choices of PhD scientists and engineers.

In this review, I consider three recent self-help books designed to assist PhD scientists in today's job marketplace. The books are similar in their advice but different in their emphasis and audience.

The most satisfying is *To Boldly Go* by Peter Fiske, of Lawrence Livermore National Laboratory. The book, published by the American Geophysical Union, is an outgrowth of a series of career workshops Fiske developed in collaboration with AGU and the placement office at Stanford University. It is aimed at recent PhDs and current graduate students who are considering widening their job search beyond the confines of academia or traditional research jobs.

The writing is breezy, to the point, well informed and very practical. In relatively brief chapters, the author covers all aspects of the career planning process, starting with useful background information, self-assessment, informational interviews, networking, résumés, cover letters and the job interview. His comments are realistic, optimistic, supportive and practical. I especially agree with his strong advice to graduate students to take advantage of their local on-campus career planning and placement offices and to develop personal relationships with career counselors.

The notebook format of the book is especially useful in the chapter in which nearly full-size résumés are presented for six young scientists. For each scientist, more than one résumé is presented, clearly illustrating concepts like the difference between a résumé and curriculum vitae and the need and strategy for tailoring one's résumé to specific job openings. A second edition of the book will be issued shortly through the American Association for the Advancement of Science. My advice would be to get this book into the hands of graduate students as early as possible in their studies (perhaps with a subsidy from the departments and/or the professional societies).

The author of *Tomorrow's Professor*, Richard M. Reis, is the executive di-

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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 counselor 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