

are topics such as stopping power and linear energy transfer.

Everything you might want or need on the road to understanding radiation interaction is clearly and concisely handled. The new chapter on statistics for medical and health physics is excellent, covering not only standard radioactive decay statistics but also minimal detectable activity, lower level of detection and type I and type II errors. New material has been added on radon, radon daughter products and environmental radioactivity. Other chapters have been brought up to date with new material on human exposures to radiation, cellular effects of radiation and probability of causation, and there are discussions of the new radiation limits from the International Commission on Radiological Protection (publications #60, 61) and the National Commission on Radiation Protection (report #116).

The inclusion of annotated bibliographies and updated questions (with answers to about half) will make it even more valuable to those using it as a graduate text. Don't think this is a book for graduate students and teachers alone, however; it is a fine reference for anyone working in radiation protection. And in an era where some softcover books cost more than \$50.00, the \$69.95 price for the hardcover edition is a bargain.

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## Abell's Exploration of the Universe

David Morrison, Sidney Wolff and Andrew Fraknoi  
*Saunders (Harcourt Brace), Philadelphia, 1995. 7th edition. 682 pp. \$52.00 hc ISBN 0-03-001034-9*

## Astronomy: From the Earth to the Universe

J. M. Pasachoff  
*Saunders (Harcourt Brace), Philadelphia, 1995. 4th edition. 663 pp. \$46.75 pb ISBN 0-03-001667-3*

The Saunders College Publishing unit of Harcourt Brace has published the seventh edition of *Exploration of the Universe*, originally the late George Abell's text. The new text has been authored, as was the sixth, by David Morrison and Sidney Wolff, with Andrew Fraknoi joining that accomplished pair for this edition. Saunders

has also released *Astronomy: From the Earth to the Universe*, Jay Pasachoff's fourth edition of his college text. Both Fraknoi and Pasachoff have significant track records for innovation in the teaching of introductory astronomy.

The former text has been in heavy use for long enough to be termed "venerable," while the latter is no Johnny-come-lately to the very crowded world of astronomy texts intended for the satisfy-your-science-requirement courses taught at the majority of American colleges and universities. This version of Pasachoff's text is actually a reformed presentation of his much earlier *Contemporary Astronomy* (Saunders, 1989), which presented the material starting with stellar astronomy, proceeded through the galaxy to cosmology and finished with the study of the solar system. The present text, as its title implies, follows the same geometric progression, beginning close to home and moving outward. Thus both Pasachoff's and Abell's texts (I shall refer to the latter in that way with apologies to Morrison, Wolff and Fraknoi) share a geometric organization.

This general-sequence philosophy tends to be the controlling factor when considering a text for an introductory course. Many schools offer only a one-semester course, while others offer a two-semester sequence. My experience is with the latter, so my bias is towards texts that supply sufficient information for a full two-semester treatment. It is pretty clear that both of these texts contain too much material to be covered in any reasonably complete way in a one-semester course.

My personal preference (which I suspect is the majority approach) is to follow the basic sequence used in these texts. However, the specific treatments of these two texts do differ in significant ways: Abell proceeds in the early chapters in a historical vein, offering much more coverage of this heritage than does Pasachoff. However, after launching into this historical development, Abell spends four chapters developing the physics necessary to discuss stellar and galactic astronomy (including relativity) before embarking on a treatment of the solar system. Pasachoff employs this same sequence but with much less material, devoting only one chapter to light and telescopes before going on to discuss the planets.

The Pasachoff book is subjectively a less "intense" text, virtually devoid of algebra. Abell includes algebra where it is reasonable to the discussion, but the text is still accessible to those students with the increasingly prevalent math phobia. Pasachoff includes a surprising amount of sophisticated information but, disturbingly, much of

it is presented in figures (and their captions) with only a bare reference in the accompanying textual discussion.

My preference is for the level of treatment in Abell. Both texts are reasonably current. Keeping astronomy texts current places a continuing burden on publishers, although it does have its compensation: Coming out with frequent new editions allows them to defeat the used book market. Of course the rapid evolution of astronomy is itself the clearest indication of the vitality and excitement in the subject, something these books competently convey.

Let me conclude with some remarks concerning the relative merit of these books as compared with those offered by other publishers. I am aware of no other that exceeds Abell in any significant and objective way. However, *Astronomy, The Evolving Universe* (Wiley, 1995) by Mike Zielik and *Universe* (Freeman, 1994) by William Kaufmann (whose recent untimely death was a most unfortunate loss for the pedagogy in this field) are, along with Pasachoff, worthy of consideration. The recent book by James Fix, *Astronomy, Journey to the Cosmic Frontier* (Mosby, 1995), is also worth a look. Finally, as all of these generic texts are limited in the depth to which they can delve, one can consider the use of a supplementary text, especially for the planetary science part of a solar system course, and there is an increasing number of those from which to choose.

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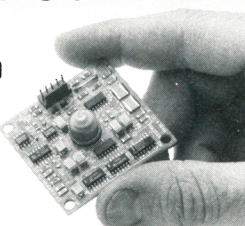
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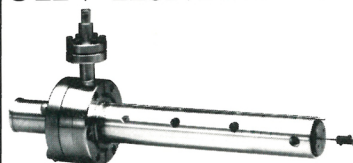
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