begin the study of any specific subject in reactor safety.

HAROLD W. LEWIS
Department of Physics
University of California
Santa Barbara

Industrial Applications of Lasers

J. F. Ready
588 pp. Academic, New York, 1978. $28.50

This book, a survey of the present use of and future possibilities for lasers in industry, is intended for people contemplating the use of lasers in an industrial application. As such, it is a technical report on the status and direction of laser applications in the late 1970's. The book was written by John F. Ready, a scientist at the Honeywell Corporate Research Center, and author of an earlier laser monograph, *Effects of High Power Laser Radiation* (Academic, 1971). The comprehensive survey touches nearly every application that has any industrial potential.

After a necessarily brief review of lasers and their properties, Ready discusses their care and maintenance. I know of no other single repository of useful information on damage and deterioration in lasers and on the care and maintenance of the devices. This chapter is well done. In the succeeding chapter on laser safety Ready takes a common-sense attitude that is needed in these days of intimidating light shows and draconian laser-safety rulings. Chapters on laser measurement are informative and relatively comprehensive because a good deal of the basic research and development has been done. The same comments apply to the chapters on material processing, which is Ready's forte. The sections on holography and information-related applications suffer by comparison. While Ready asserts the importance of optical-fiber communications, he does little to give the reader a feel for the limitations and difficulties, and the important parameters of current systems. Ready is not at fault, because an enormous acceleration in development in this field occured during the book's production.

The text also contains a short chapter on recent work on chemical applications of lasers. Ready's statement on Raman spectroscopy is somewhat misleading in that he asserts that the "variety of laser wavelengths makes it possible to carry out Raman Spectroscopy while avoiding interfering absorption bands. With a tunable laser, the excitation frequency can be tuned to produce a larger Raman signal." In fact, it is excitation into those absorption bands that produces the enhancement. It is fluorescing bands that can (sometimes) be avoided by a judicious choice of laser wavelength.

While Ready intended "to make the book reasonably self-contained," he did not extend this concept to the various chapters by including back references to concepts explained earlier in the text. Therefore, a reader may not be able to dip into a particular chapter of interest without a good deal of thumbing through the index and the earlier chapters of the book. In some cases, however, even this strategy cannot guarantee success. Ready mentions a retroreflector in chapter 8 without explanation but describes it in chapter 10 (and later in the chapter explains it again in a footnote). Certain passages, particularly those on semiconductor lasers, are repetitious, and other passages mention without explanation a number of uncommon concepts (getters, dithering servo, spatial filtering, flatpacks and ECM machines, for example).

This book is appropriate for those outside a particular field of laser application who want to gain an elementary understanding of that field. As such, it will be a useful addition to industrial and university libraries. The text is not, however, useful for a designer of laser systems to consult for answers. It is a detailed report card on the 18-year-old laser as it comes of age. John Ready's book gives the laser impressive marks.

DONALD C. O'SHEA
School of Physics
Georgia Institute of Technology
Atlanta

Beyond the Moon

P. Maffei
377 pp. MIT, Cambridge, 1978 (first Italian edition, 1973). $12.50

Paolo Maffei tells us that his new book *Beyond the Moon* is the story of a voyage through space. He means to show us the wonders of the universe by starting from the Moon (where we have already voyaged via Apollo) and visiting in turn each planet, the stars, star clusters, galaxies, clusters of galaxies, and the universe itself as a cosmological whole. While he claims that the book is not quite a textbook of astronomy, it is hard to see it as anything else. In reality, it is little more than a catalog of astronomical facts, laid out in the usual format of introductory textbooks, but lacking the elegance that characterizes many of the other texts that have appeared in recent years.

If the reader should casually page through the book, he will find, for example, that Mercury has a weak magnetic field (0.0037–0.0070 gauss); Venera 9 and Venera 10 landed 2200 km apart; the light curve of β Lyrae eclipses every 12 days, 22 hours, 22 minutes; Mira Ceti is 163 light-years from us; and by June 1970, 1603

clusters had been found in the Large Magellanic Cloud. What we will not find is a feel for how astronomy is done, a sense of the excitement of discovery, or an appreciation of the people who have contributed to our knowledge and understanding of the universe. The book seems to be addressed to the uninformed reader who is solely interested in masses of astronomical facts. Such a reader, however, will find the level of many parts of the book difficult—Maffei presents concepts like $H\alpha$, magnetic-field strength (gauss) and spectral-line intensity without explanation.

The figures are all black and white and are the usual ones found in any astronomy text. One figure *is* surprising; it is obviously an older one that has not been updated, even though Maffei himself is reasonable for the discovery that requires a revision—The diagram of the local group on page 352 does not show the Maffei galaxies but only notes their position in the caption.

Maffei's idea for writing this book came from his feeling that the space program has made people aware of space and in need of an astronomical education. While he does note a few recent space missions (Viking, Uhuru, Pioneer, Mariner), he completely ignores many of the other missions, both operating and planned at the time of writing the book, that makes the space program an exciting scientific venture—HEAO, Voyager, Space Telescope, Pioneer-Venus, Copernicus (OAO-3).

The five appendices at the end of the book are a rather ecletic collection of subjects: determination of distances of the stars; discovery, nomenclature and distribution of variable stars; celestial atlases and catalogs; the Maffei galaxies, and life in the universe.

The book went through six editions in Italian between 1973 and 1977. Daniel J. K. O'Connell, formerly director of the Vatican Observatory, translated the last edition into English.

RICHARD C. HART
Space Science Board
Assembly of Mathematical and Physical Sciences
National Research Council
Washington, D.C.

Nuclear Weapons and World Politics: Alternatives for the Future

D. C. Gompert, M. Mandelbaum, R. L. Garwin, J. H. Barton
370 pp., McGraw-Hill, New York, 1977.
$10.95 clothbound, $6.95 paperbound

In this important book, four highly qualified scholars look at where we are heading in the decade or two ahead as weapons technologies advance and new nuclear