

parameters governing the design of a fusion reactor. They then devote the main part of the book entirely to explaining and evaluating the basic principles, physics, problems and present status of development of various reactor concepts presently under investigation. In this part, a large section, leading up to a very useful comprehensive list of parameters for the large experimental and reactor designs presently envisioned or in construction, is devoted to tokamaks—the system that is clearly the most successful so far. Other major concepts—like the magnetic mirrors and pinches, and also an interesting variety of ten exploratory concepts, ranging from Bumpy Torus and Astron to the laser-heated solenoid—are given space roughly according to the size of the respective present research effort. Unfortunately, however, the important area of inertial fusion (laser or charged-particle beams) is treated only very briefly. Also, the potentially important area of fusion-fission hybrid systems is essentially omitted.

Throughout the book, the authors make their explanations and evaluations by briefly developing a semiquantitative description of the physical processes involved rather than by exhibiting the more customary formalistic derivations. This procedure, though obviously not very rigorous scientifically, permits the attentive reader—even if he is uninitiated at the beginning—to acquire quite quickly a useful, although of course still quite basic, understanding of a surprisingly wide range of modern concepts and results, and of their importance for the prospects of thermonuclear fusion. Hagler and Kristiansen present additional useful facets for a next-deeper level of understanding in a well developed system of footnotes. A fluid, often even colloquial writing style helps to increase the attention span of the reader.

A certain drawback of the book, I feel, lies in its not so well developed organization. In particular, it appears that some of the basic plasma physics that is used at more than one place would better be collected in the respective introductory chapter. Also, most of the appendices following the various chapters appear out of place: Some of this material could easily be incorporated in the main text, while other parts do not add much to the overall understanding at this level. In addition, specialists in various areas may find some distraction in a somewhat larger-than-usual number of incidents of clear sloppiness or outright mistakes in the details of some explanations. (The description of our own effort happens to be one example.)

Overall, I feel that the book—although not spotless—clearly is a valuable addition to the otherwise rather sparse book market on fusion. I expect that it will prove really useful for the intended audience, and also for a significant number

of more advanced readers. In addition, it appears that the book would be an excellent choice as a complementary text for many college courses on plasma physics that tend to focus on the mathematically formalistic base and to show too much benign academic neglect for many of the important physics and engineering aspects presented in this book.

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book notes

Handbook of Optics. W. G. Driscoll, ed. 1172 pp. McGraw-Hill, New York, 1978. \$55.00

Handbook of Optics, prepared specifically for optical systems designers, is a one-volume source of technical data in the field of optics. Sponsored by the Optical Society of America, the book covers, among other things, topics such as lens design, optical materials, light detectors, thin films, electronic detectors, photographic materials, image tubes, optical fibers, light measurement systems, eyes and vision, optical instruments for metrology, optical modulators, colorimetry, polarization and spectroscopy.

Handbook of X-Ray and Ultraviolet Photoelectron Spectroscopy. D. Briggs, ed. 398 pp. Heyden, Philadelphia, 1977. \$60.00

The contributors to this volume have attempted to provide the essential principles of x-ray and ultraviolet photoelectron spectroscopy, particularly for newcomers to these fields. Topics covered include spectrometer design, calibration and performance, sample preparation and handling in the major fields of investigation, interpretation of spectra and the kinds of information that can be obtained with these techniques. Those investigators already established in these fields may find the comprehensive reference lists and appendices useful.

The Chamber of Physics. G. Pipping. 250 pp. Almqvist and Wiksell, Stockholm, 1977. \$13.00

This volume contains a catalogue of instruments in the History of Science Collections of the Royal Swedish Academy of Sciences in Stockholm. Gunnar Pipping, deputy keeper of the Swedish National Museum of Science and Technology, has preceded the catalogue with chapters on two of the sources of the Collections: the Stockholm Observatory and its instruments and the *Apparatus Physicus*, or Chamber of Physics, of Johan Carl Wilcke (1732–96), the Academy's Thamian Lecturer in Experimental



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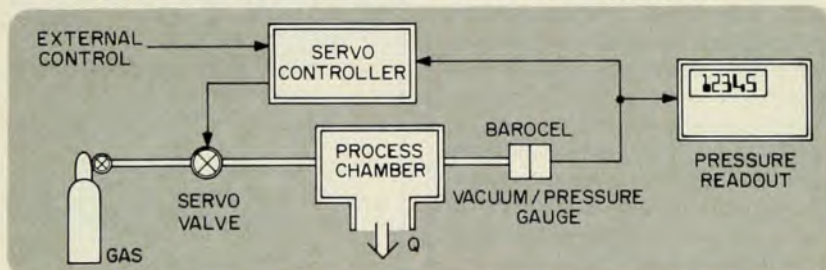


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Physics. Other chapters describe instrument-making in Sweden and give biographical information on instrument-makers. The book is illustrated with 43 photographs.

Coronal Holes and High Speed Wind Streams: A Monograph from Skylab Solar Workshop I. J. B. Zirker, ed. 454 pp. Colorado Associated U.P., Boulder, 1977. \$10.00

The origin, development, physical structure and relation to the solar wind of coronal holes was the focus of three sessions of the Skylab Solar Workshop held between October 1975 and August 1976. This volume is a summary of the contributions made by Apollo Telescope Mount experiment teams, guest investigators and other scientists who analyzed and interpreted the ATM data and who participated in these sessions. —CBW

new books

Particles, Nuclei and High-Energy Physics

Quantum Mechanics, Vols. 1 and 2. C. Cohen-Tannoudji, B. Diu, F. Laloe. 1524 pp. Wiley-Interscience, New York, 1977 (French edition, 1973). \$32.50 and \$27.50

Nuclear Heavy-Ion Reactions. P. E. Hodgson. 588 pp. Clarendon (Oxford U. P.), New York, 1978. \$45.00

Atomic, Molecular and Chemical Physics

Symmetry and Spectroscopy: An Introduction to Vibrational and Electronic Spectroscopy. D. C. Harris, M. D. Bertolucci. 550 pp. Oxford U. P., New York, 1978. \$16.00

Vibrational Spectra and Structure: A Series of Advances, Vol. 7. J. R. Durig, ed. 388 pp. Elsevier, New York, 1978. \$63.50

Polymer Stress Reactions, Vol. 1 (Introduction). A. Casale, R. S. Porter. 252 pp. Academic, New York, 1978. \$21.00

Optics and Acoustics

Handbook of Optics (sponsored by the Optical Society of America). W. G. Driscoll, ed. 1172 pp. McGraw-Hill, New York, 1978. \$55.00

Quantum Electronics and Lasers

Heterostructure Lasers, Parts A (Fundamental Principles) and B (Materials and Operating Characteristics). H. C. Casey Jr, M. B. Panish. 272 and 330 pp. Academic, New York, 1978. \$23.00 and \$29.00

Fluids and Plasmas

Shock Tube and Shock Wave Research (Proc of the 11th Int. Symp. on Shock Tubes and Waves, Seattle, July 1977). B. Ahlborn, A. Hertzberg, D. Russell, eds. 655 pp. Univ.