V. Sobolev, although many of the results presented also can be obtained by Case's method (see K. M. Case and P. F. Zweifel, *Linear Transport Theory*, Addison-Wesley, 1967). Considerable space is given to research carried out in recent years at the University of Leningrad. The book stands as the definitive current reference for analytical line transfer solutions based on the two-level atomic model.

Similar problems are treated by computational methods in a recent book by R. G. Athay, *Radiation Transport in Spectral Lines* (Reidel, 1972). Related physical applications are discussed by J. T. Jefferies, *Spectral Line Formation* (Blaisdell, 1968) and D. Mihalas, *Stellar Atmospheres* (Freeman, 1970).

The translation by Eileen Weppner and D. G. Hummer is an excellent one, and reflects Hummer's complete knowledge of the subject and his familiarity with Ivanov's published work. The material should be of interest to those who study the theory of neutron diffusion as well as those who deal with radiative transfer theory.

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Astrophysical Concepts

Martin Harwit
561 pp. Wiley, New York, 1973. $14.95

This is a book I would like to have my students read, particularly those whose background in physics has been weak or highly specialized. It gives a broad panorama of what might be called the physics of modern astronomy. Martin Harwit treats topics from the point of view of the physical principles believed to be involved rather than according to conventional dichotomies as to subject matter. Hence surprising juxtapositions of topics, such as galaxies and molecules, sometimes appear.

Discussion of modern developments does not crowd out classical subjects. Harwit's style in dealing with physical principles is lucid and clear, and he is to be commended for patiently explaining steps in derivations that are often glossed over or regarded as patently obvious by less skilled teachers. A nice feature of this treatment is the excellent set of problems, the solutions of which are given in the text. The material will be of great help to the student who likes to dig things out on his own. To a large extent the basic physics so necessary to modern astronomy is developed *Ab initio*.

It is unfortunate that important topics like synchrotron radiation could not have been developed in a more thor-

ough way—perhaps at the cost of simply quoting results of the two-body problem whose development now appears in many beginning physics texts. In attempting to cover such a broad spectrum of subject matter, embracing so much of physics and astronomy in a mere 500 pages, it is inevitable that some topics are handled in an inadequate or frustrating fashion. The student *first* should read a good elementary text such as George Abell's *Exploration of the Universe*. Chapter 2 could have been deleted. Likewise, the discussion of stellar atmospheres and spectral line formation cannot be recommended. The value of the text would have been greatly enhanced by a careful set of reading guides to significant references including review articles and monographs. While references to original literature are to be commended, documentation of a minor interpolation formula can scarcely substitute for mention of truly fundamental work by the same author.

It is unfortunate that the most engaging problems posed by the nearest star, the Sun, are scarcely even mentioned. Only in certain solar flares can we actually witness the origin of cosmic rays and obtain an insight in what may be expected in the outer envelopes of other normal stars. The speculations on tachyons could easily have been sacrificed to provide space for these really basic topics.

In summary, Harwit is to be congratulated on producing a worthwhile contribution to the astrophysical literature.

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Nuclei, Nuclear Physics

Physique Nucléaire. D. Blanc. 360 pp. Masson, Paris, 1973. 95 F

The Theory of Polarization Phenomena. B. A. Robson. 119 pp. Oxford U.P., New York, 1974. $17.75

Chemical Physics

Quantum Chemistry, 2nd ed. I. N. Levine. 506 pp. Allyn and Bacon, Boston, Mass., 1974.

Vibrational Spectra and Structure, Vol. 2. J. R. Durig, ed. 417 pp. Marcel Dekker, New York, 1975. $37.50

Optics

Aberrations of the Symmetrical Optical System. W. T. Welford. 240 pp. Academic, New York, 1974. $20.00

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