Astrophysics of the Sun, by Harold Zirin (Cambridge University Press), 1988. Pp. 433, 9½×7½ inches. Price £37·50/$49·50 (cloth), £12·95/$22·95 (paper).

Astrophysics of the Sun is a partially re-written and revised version of Zirin's previous text The Solar Atmosphere, which was published in 1966. The aim of the new volume remains basically the same; the first half gives simple summaries of relevant physics, the second half gives a systematic account of solar observations from the photosphere through to the corona. Since 1966 there have been major advances in observing the solar outer atmosphere from space, through imaging telescopes and spectrographs carried on rockets, satellites, the Skylab space station and the Space Shuttle. Ground-based observing techniques have also improved and new fields such as helioseismology have been developed.

Astrophysics of the Sun contains much to recommend it. The volume is attractively produced and generously illustrated. Zirin's enthusiasm for his subject shines through and his informality enlivens the text. Who else would comment on the relative merits of nose oil and well-washed diapers for producing a static-free lens? The book provides a stimulating introduction for students of solar physics but they should be warned that the conclusions presented cannot always be regarded as the last word on the subject. When it comes to the interpretation of observations, Zirin's view is sometimes over selective and other equally-experienced solar physicists would reach different conclusions.

The first half includes a good chapter on basic instrumentation, with commendable practical detail, as one might expect from a seasoned observer. Chapters 4 and 5, which cover radiative transfer and atomic physics, have not been significantly revised but some additions have been made. Usually one would not comment on the occasional misprint but it is very unfortunate that the new material is plagued with typographical errors, to the extent that the value of the chapters for unwary student readers is greatly reduced. For example, equations 4.27, 4.29, and 4.30 are wrong by factors of 10, \nu and \pi respectively. Equations 4.32 and 4.39 are incorrect. Similar problems exist elsewhere. The section in Chapter 4 on collisional excitation rates is sadly out of date referring to approximations that have ceased to be necessary given the advances over the past ten years or so. A mention of modern atomic parameter data bases would give better guidance to graduate students. While these first few chapters do bring out the variety of the physics required in modern studies of the Sun and stars, the relaxed style does lead to some imprecision. On a more general matter, the continued use of cgs rather than SI units may prove to be a barrier for students outside the USA.

The revised second half of the book is far more successful. The ordering of the material is better than in the previous text and modern developments regarding solar neutrinos and global oscillations are included. New ultraviolet and X-ray observations of the chromosphere, transition region and corona are discussed and illustrated and the current problems in understanding basic physical processes are brought out. The chapter on solar flares cannot hope to be comprehensive given a decade of rapid advances from observations via satellites, but the important relationship between the magnetic-field configuration and interconnection of different temperature regions is duly stressed. The only section where further new material might have been included is the one on active regions which does not take advantage of the many beautiful examples of nested magnetic-loop structures observed, in particular, during the Skylab missions. Our knowledge of the structure of active regions at transition region and coronal temperatures has increased significantly since the days of describing them as 'coronal condensations'.

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