Plasma Astrophysics. Kinetic Processes in Solar and Stellar Coronae, by A. O. Benz (Kluwer, Dordrecht), 1993. Pp. 299, 9¾ × 6½ inches. Price £71/$99 (hardbound; ISBN 0 792 32429 3).

Despite the numerous apocryphal (?) stories about Sir Fred Hoyle's remarks, a star is *not* a very simple thing, least of all when viewed from five micro-parsecs, as is the Sun. Nor for that matter is a plasma a very simple thing, even when it can be studied *in situ*. (Another unattributed apocryphal story describes the equations of plasma physics as like the perfect companion — superficially simple and handsome enough to attract in the first instance but complex enough to occupy a lifetime.) As a combination of such subjects, solar plasma physics is, not surprisingly, one of the most fascinating and demanding topics there could ever be, and one which can only benefit from the addition of as many textbooks as possible.

Despite the title, Benz's *Plasma Astrophysics* is first and foremost such a book, with the plasma physics of stars other than the Sun playing a secondary rôle, as is inevitable in our present state of knowledge. There has been quite a stream of solar textbooks in the past decade, covering many aspects of solar plasmas and the solar–stellar connection, and at a wide range of levels. These range from Phillips' semipopular introduction to the Sun, through intermediate texts emphasizing primarily instrumental/observational or theoretical aspects (*e.g.*, Zirin, Durrant, Stix) to specialized monographs on particular aspects such as MHD (Priest) or sets of similarly specialized articles (such as Sturrock & Holzer, Schmeltz & Brown). What is most striking in the area of theory about this stream of books, with the exception of a few chapters, is that they concentrate almost exclusively on MHD or spectral diagnostic aspects of solar-atmospheric physics. This is to some extent a reflection of the division of the solar–plasma-theory community into atomic spectroscopists, MHD theoreticians, and 'true' plasma theoreticians, with the availability of textbooks heavily biassed away from the latter. This bias is very unfortunate since much of the most interesting physics of stars, and the key to understanding many of their most fascinating phenomena, lie at the microscopic/kinetic level and in 'nonthermal' deviations from fluid behaviour.

Benz's monograph is a very welcome addition to the literature in helping to reduce this bias, dealing best with precisely these rather neglected areas of solar and stellar plasmas, though providing a basic introduction to large-scale MHD aspects. From the point of view of the reader (at or above advanced undergraduate) seeking to become familiar with most of the key processes and contemporary issues in solar plasmas and analogous stellar problems, the book is very well written with an unusually good balance between mathematical development and physical insight. Topics addressed, with more or less uniform lucidity, are: basic concepts; MHD and wave aspects; currents, beams, instabilities, and kinetic phenomena; magnetic trapping; radiation processes; shock waves and acceleration. A useful compendium of units, terms, and mathematics concludes the book.

There are two, somewhat interrelated, areas in which the treatment falls short of ideal. First, reference to existing literature is in places rather patchy, citing somewhat peripheral rather than key papers. Secondly, in some of the more technical points the conclusions reached are incorrect or misleading. One such point, with which the reviewer is personally familiar, is that the electrostatically driven beam return current exists only near the beam head, in contrast to the inductively driven one. This only applies to a semi-infinite rigid beam. As