

Handbook of Space Astronomy and Astrophysics (3rd Edition): by M. V. Zombeck (Cambridge University Press), 2006. Pp. 767, 23.5 × 15.5 cm. Price £50/\$95 (hardbound; ISBN 0 521 78242 2).

I have to confess to having a soft-spot for this book. In its various incarnations it has been a constant companion for my entire scientific career, from the original Smithsonian Astronomical Observatory report through to the very well-thumbed and rather decrepit 2nd edition that currently resides on the book shelf in my office. Nevertheless, in this review, I have attempted to set personal feelings aside and examine objectively whether or not this new version of the handbook is an improvement on earlier issues and whether or not it is worth buying.

The first CUP edition of the handbook received a fairly negative reception in its 1983 Observatory review (Vol 103, p261) and was compared rather unfavourably with Allen's *Astrophysical Quantities*. With hindsight, many of the criticisms leveled then were reasonable, with patchy coverage, a strong X-ray bias and haphazard layout being among the most serious problems. It is likely that my affection for the contents arises from my own background in X-ray astronomy and the usefulness of book for those of us involved in building instrumentation. Perhaps this is where the earlier review slightly missed the point. The Handbook of Space Astronomy and Astrophysics is not an attempt to replicate "Allen". It does include quite a large quantity of similar astrophysical data (some it taken directly from *Astrophysical Quantities*) but also a lot more related to astronomical instrumentation, the physics of devices and space physics which can only otherwise be found by searching a number of reference sources.

Compared to the last edition, the new version of the handbook has almost double the number of pages and represents a considerable expansion of the content of each chapter. Examples of improvement include updated lists of Solar System natural satellites and high redshift objects. There are also complete new sections such as the list of extra-solar planets, none of which had been detected when the last edition was produced. However, some sections remain irritatingly limited and some are quite outdated. The precision of the wavelengths quoted for UV spectral features has never matched the spectral resolution of the available instrumentation and still does not, so the information is not at all useful for line identification purposes. The maps of interstellar column density are more than 20 years out of date and have been superseded by considerably more detailed information in the last few years, based particularly on ground-based Na measurements and Far Ultraviolet Spectroscopic Explorer studies, a mission which is not mentioned at all. In general, the data on space instrumentation still betrays something of a US-centric bias. Yes, ESA's XMM-Newton Observatory is mentioned along with the NASA Chandra mission, in the X-ray chapter, but there is no mention of ISO in the Infrared Astronomy section and only EUV sources detected by Extreme Ultraviolet explorer are listed when the first EUV survey was carried out by the ROSAT Wide Field Camera.

So, the Handbook of Space and Astronomy carries some of its original flaws like badge of honour. Coverage of topics within the various chapters remains patchy. Also, I think the book would benefit from a more thorough update of the original material not just the addition of new items, which are the main changes in this 3rd edition. Nevertheless, there is a lot of material, particularly that pertaining to the basic

tools of an instrument developer and observer in space astronomy that, to my knowledge, is not usefully collected in any other single volume. It is certainly worth purchasing by anyone wanting a ready reference for basic instrumentation and observational techniques, although it is probably most useful for scientists working in high energy astrophysics. I have no doubt that my copy of the 3rd edition will be as well-used as the previous one. – MARTIN BARSTOW