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Encyclopedia of the History of Astronomy and Astrophysics [book review]

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The Encyclopedia of the History of Astronomy and Astrophysics is written by David Leverington, author of similar titles including *A History of Astronomy from 1890 to Present* (1996, Springer-Verlag) and *Babylon to Voyager and Beyond: A History of Planetary Astronomy* (2000, Cambridge University Press). Leverington has a degree in Physics from Oxford University and has worked extensively in the space industry.

This work is not organized as a typical encyclopedia with an alphabetical arrangement of entries. Rather the work is divided into ten subject areas, each containing 2-3 chapters, which further break down into main topics.

Part one, General Astronomy, discusses the ancient astronomy (pre-telescope) of various geographic regions (Babylon, China, Egypt, Greece, Islamic nations, North America, etc.). Each region is addressed in one to two pages, with Greek astronomy receiving up to four pages. The second chapter is a period overview starting in the seventeenth century and going through the present. Oddly, the last chapter is a one-page entry on the International Astronomical Union (IAU). What's strange is there's no mention of any other key astronomy organizations in the book, such as the American Astronomical Society, which predates the IAU.

Part two focuses on the history of the solar system, primarily the individuals, methods, origins, and developments in the discovery of the sun, earth, moon, planets, and smaller objects such as asteroids, comets, and meteors. Part three expands this discussion to the stars, emphasizing individual characteristics—atmospheres, magnetic fields, rotations, temperatures, distances, and masses—and group—internal structure, sources of stellar energy, spectral classification of stars, etc. Going further outward, part four covers galaxies and cosmology, with the Milky Way receiving its own chapter. Part 5 focuses on the history of astronomical tools and techniques such as adaptive optics, photography, photometry, radiometry, and more. Parts six through eight highlight telescopes and observatories, with each section providing the history of a different type: optical, radio, and other ground based observatories. The final two sections are on spacecraft, with one emphasizing exploration and the other

space observatories that gather data on the spectral range, including gamma rays, infrared, ultraviolet, x-rays, and more.

Although there is much included in this 500+ page work, most of the subjects are covered in brief, providing the reader with a simple introduction. However, each entry has a bibliography that one can consult for more comprehensive coverage. Most of the book is text, although there are a few figures, tables, and photographs. Particularly noticeable is the lack of biographical entries. There is a name index, but important scientists and discoverers are only addressed in the context of other subject entries. The text is written for college level readers that have some understanding of the subject matter.

Compared to other sources, how does *The Encyclopedia of the History of Astronomy and Astrophysics* stack up? *The Cosmic Century, A History of Astrophysics and Cosmology* (2006, Cambridge University Press) by Malcolm Longair emphasizes astrophysics and doesn't cover any ancient astronomy. Historical coverage begins in the 19th century and topics addressed in both books such as stellar structure and evolution are covered more comprehensively in Longair's work. Longair also includes in-text citations to primary research literature and has an extensive bibliography. *Babylon to Voyager and Beyond: A History of Planetary Astronomy* (Leverington) places more emphasis on the planets. Each planet is given 2-3 times the coverage than in *The Encyclopedia of the History of Astronomy and Astrophysics*. However, in *Babylon to Voyager and Beyond* coverage of ancient astronomy is primarily restricted to the Babylonians and Greeks. Also, it does not provide much coverage of space exploration or observatories. The *History of Astronomy, An Encyclopedia* (1997, Garland Publishing), edited by John Langford, has a standard alphabetical arrangement of entries common to many encyclopedias. The scope is from the Scientific Revolution to the present, but there are summaries of astronomy in ancient and medieval periods. In comparing the entry on Chinese astronomy, Leverington's work tends to emphasize astronomical observations or achievements made in China, while Langford focuses more on the role of individuals and dynasties had in shaping astronomy. Langford's work also has biographical descriptions of prominent astronomers, and entries dealing with the social history of astronomy such as *Literature and Astronomy* or *Women in Astronomy*. Yet, this work doesn't have near the astrophysics coverage as Leverington's. In short, if your library already has the book by Longair for astrophysics, and either Leverington's *Babylon to Voyager and Beyond* or The *History of Astronomy, An Encyclopedia*, no need to purchase *The Encyclopedia of the History of Astronomy and Astrophysics.* However, what the latter work does well is combine the history of astrophysics and astronomy into one, well written volume, and at $75 isn't too expensive. Recommended for libraries without comparable works or looking for a single volume on the history of astronomy and astrophysics.