

Observing Visual Double Stars

Paul Couteau (translated by Alan Batten), The MIT Press, Cambridge, MA, 1981, 273 pages, illustrated, \$19.95.

Double stars - more specifically, those that form true binary systems - are of inestimable value to astronomers because their orbits, once calculated, yield the only direct means of determining stellar masses. Unfortunately, rapid advances in other fields of astronomy have resulted in a steady dwindling of the ranks of professional double star astronomers. Today, little more than half a dozen professionals face the almost hopeless task of monitoring the thousands of known visual binaries. Readers of this journal are well aware of the crucial role the AAVSO plays in providing professional astronomers with much-needed data on variable stars. In essence, Observing Visual Double Stars is a plea from a professional double star astronomer for a similar kind of amateur-professional cooperation.

In the opening chapter, author Paul Couteau provides background material on the nature of double stars and the history of double star astronomy. Then follow two chapters that cover optical concepts pertaining to double star astronomy and the kinds of instruments used to measure double stars. Emphasis is given to the filar micrometer, which is the device most widely used for determining the separations and position angles of visual double stars. In Chapter 4, Couteau figuratively places a hand on the reader's shoulder and, with the wisdom gained during three decades of double star work, offers a variety of useful observing tips. His admonition that, "everything that an astronomer does in the dome carries his signature; he works in order to publish his observations, which will be judged by his peers, sometimes long afterward," will ring true to anyone who has ever made a variable star estimate for the AAVSO. So critical is the proper identification of a particular double star via the various kinds of star catalogues that Couteau devotes an entire chapter to the topic.

The heart of Observing Visual Double Stars is Chapter 6, "Computation of Orbits and Stellar Masses." Here, through specific example, we see how a series of measures of separation and position angle for a binary system can lead to the computation of its orbit, and thence to a determination of the individual masses of its component stars. This section is the most technical of the book, but much of it can be handled by anyone possessing a solid background in spherical trigonometry. The not-so-mathematically-inclined may wish to bypass this chapter in favor of the next, which opens with descriptions of several double and multiple star systems as they might appear to inhabitants of nearby planets. Who has not gazed in awe at a double or triple star and wondered what it would be like if our own sun were replaced by such a system?

Couteau concludes with a catalogue of 744 double stars. It is a representative list of pairs suitable for telescopes of all sizes. Wide showpieces like  $\beta$  Cygni (Albireo) and  $\zeta$  Ursae Majoris, fast-moving binaries like  $\alpha$  Geminorum (Castor) and 70 Ophiuchi, and newly-discovered doubles like  $\tau$  Arietis and  $\theta$  Coronae Borealis are included, along with recent measures for each. This section will undoubtedly be a most useful one for the general observer.

Anyone with even a mild interest in double stars will enjoy reading Observing Visual Double Stars. Couteau's love for this branch of astronomy is evident throughout the text. His enthusiasm just might inspire a few young amateur astronomers to pursue careers in double star astronomy. Those half a dozen beleaguered professionals certainly hope so.

Glenn F. Chaple, Jr.  
82 South Harbor Road  
Townsend, MA 01469

#### BOOK REVIEW

##### Photoelectric Photometry of Variable Stars

Douglas S. Hall and Russell M. Genet, International Amateur-Professional Photoelectric Photometry, Fairborn, OH, 1982, 280 pages, illustrated, \$18.95.

Photoelectric Photometry of Variable Stars is a gold mine of current information on astronomical photoelectric photometry.

The foreword is by Frank Bradshaw Wood, the editor of Photoelectric Astronomy For Amateurs (1963). His main point is that the amateur astronomer with a photoelectric photometer now can carry out work which will be of scientific significance and of permanent value.

The history of astronomical photoelectric photometry is written by Gerald Kron, student of the pioneer, Joel Stebbins. Chapters 3 through 8 cover very nicely all the "nuts and bolts" considerations of the hardware and the instruments of photoelectric photometry. Systems at various levels of complexity are covered, from the simple method of DC integrating with a meter to pulse-counting with input to a home computer. These chapters concerning the electronic equipment of necessity do require some knowledge of electronic technology in order to be understood. But the book is not too deep in that subject, because after all, photometry is an exacting science. There is enough detail given to answer most technical questions relating to photometry if the reader has a reasonable understanding of electronics.

The last one-third of the book relates to the application of the equipment, that is, how and what to observe. First to consider is the effect of the atmosphere on the starlight. The authors then take us through standardizing your photometric system in reference to a recognized system, such as the UBV system. An example is given, from the original strip-chart data through to the standardized results. There is a very good discussion on the sources of observational errors, how to recognize them, and how to deal with them. At the end is a large reference list and two appendices. Appendix A is a list of abbreviations and acronyms used in the book and their meanings. Appendix B is a list of manufacturers and variable star organizations the reader might want to contact.

Anyone interested in photoelectric photometry will find much useful information in Photoelectric Photometry of Variable Stars.

Howard Landis  
Price Road West  
RFD 2 Box 44 ED  
Locust Grove, GA 30248