BOOK REVIEW

SPACE SCIENCE AND ASTRONOMY

Thornton Page and Lou Williams Page. MacMillan Publishing Company New York, N. Y., 1976. Illustrated, Price $13.95.

Space Science and Astronomy is the ninth volume in the MacMillan Sky and Telescope Library of Astronomy series. Basically, the format is the same used in earlier volumes and extends topics touched on previously in the area of lunar and planetary exploration by manned and unmanned spacecraft. Contained therein are over 130 articles that have appeared in Sky and Telescope, the most current being September, 1975. Therefore, accounts of recent missions such as Mariner 10's second and third flybys of Mercury are included.

The contents of each chapter in Space Science are arranged chronologically by event and not by the date the article was published. For example, the chapter on Mars summarizes major spacecraft missions to the red planet starting with accounts of Mariner IV findings which postdate articles describing the Mariner VI and VII flights. This is intended to show the progression in knowledge about our planetary neighbors as clearly as possible. While the earlier chapters deal specifically with missions to the Moon and planets, the later ones concentrate on near-Earth space flights such as OSO, Uhuru, Skylab, and Soyuz.

In all, the book is much larger than earlier volumes in the series (467 pages) which probably accounts for the higher price. While all illustrations are in black and white, they are abundant and well incorporated into the text. One particularly noteworthy feature is the extensive coverage provided of the Soviet's space program. A possible shortcoming is that the majority of articles were written by only three authors so that the breadth of authorship characteristic of the series is lacking. Aside from this minor criticism, Space Science and Astronomy should provide worthwhile reading to anyone interested in a concise history of space exploration and related astronomical discoveries in the past decade.

Bruce M. Frank
8 Blackwatch Trail
Fairport, N. Y. 14450

BOOK REVIEW

AN INTRODUCTION TO EXPERIMENTAL ASTRONOMY

Roger B. Culver, W. H. Freeman and Company, San Francisco, CA, 1974, 195pp. (paperback), $5.95

Most laboratory manuals for elementary astronomy follow the same pattern. Early in the book the student makes simple measurements for himself and as the activities grow in sophistication, the manual refers the student to the professional literature for raw data. These texts are excellent in many ways, but they have limited utility to independent readers and small schools. An Introduction to Experimental Astronomy fills this gap well. It is not a text, but a collection of activities to augment an introductory text. The exercises are relevant and have good topic coverage with equal emphasis placed on the solar system, the stars, and the galaxies.

The activities all follow the same format. Photographs of objects or events of interest are presented in such a way that the student may make the measurements himself. In other situations the orientation of labs around pictures could be boring, but since so much astronomical work is done from photographs, these activities rarely seem contrived. The measurements lead naturally into

calculations or graphical analysis. The end result in each case is some quantity of astronomical interest. The topics range from a measurement of the astronomical unit through spectroscopic parallax to the determination of the Hubble constant.

Several of the experiments could be extended by an interested amateur. With this book as a guide, anyone with a camera-equipped telescope should be able to measure for himself the mass of Jupiter or establish a photometric calibration curve for a variable star field. Another possible extension would be to apply the methods introduced in this manual to the high quality pictures found in the coffee table astronomy books. For example it should be possible to construct a Wolf diagram and estimate the distance to dark nebulae in this way.

This book was intended as a laboratory text at the college level, but a reader with a background in general astronomy and a good command of high school math should have no difficulty with the material. In a few cases better picture reproduction would have improved accuracy but in most cases the results agree well with accepted values. I would recommend this book to anyone interested in learning more about the methods used in experimental astronomy.

R. S. Thompson
Pine Crest School
Fort Lauderdale, FL 33308

BOOK REVIEW

BLACK HOLES, QUASARS, AND THE UNIVERSE

Harry L. Shipman, Houghton Mifflin Company, Boston, MA, 1976. 303pp. $12.95

Shipman has written this book for the nonscientist. He has put into easy-to-understand terms three of the most interesting topics of astronomy: black holes, quasars, and the universe. The Preliminary section gives the reader some basic astronomical terminology. In the Introduction, Shipman explains the difference between the "model-world" which exists in the mind of the theoretician, and the "real-world", the world in which we live. This section is like the scent of chocolate - you know that what is to follow will be very enjoyable...and it is!

The first section, "Black Holes", describes the type of stars that makes the best candidates for black holes (stellar corpses) and why. It also explains why some stars couldn't possibly evolve this way. Shipman constantly distinguishes between knowledge from the "model-world" and from the "real-world". This is important because newspapers give the general public the idea that black holes have actually been discovered. They don't adequately stress the uncertainties involved in the research.

After we learn the possible properties of a black hole, we accompany an imaginary astronaut on a mission to see what's in a black hole. He takes an armload of clocks. He will place them, one at a time, in different points of orbit around the black hole. Back on the rocket ship, observers will learn much about the tremendous gravity of the black hole, but unfortunately, the poor astronaut can never return from inside the black hole. Once inside, nothing, not even light can escape, much less his radio signals to the ship. It's rather like saying, "I'm going to find out if there's life after death if it kills me".

Shipman, in this chapter has given me the clearest idea I have had yet about what a black hole might be like. The parallel he draws between it and the probable fact that Cygnus X-1 is a black hole is the finest example of explanatory writing I have yet come across.