

BOOK REVIEW

PHOTOGRAPHIC SKY ATLAS

Christos Papadopoulos, Pergamon Press, Oxford, 1977.
Volume I, \$100. Volume II, \$150.

The lack of a suitable atlas of the sky has long hampered amateur observers, particularly those of us engaged in the work of making new variable star charts. Existing atlases have taken two forms, those drawn from catalogs of star positions, and those derived from photographs. In the first group there are usually many stars left out simply for lack of precise position data, and the limiting magnitudes are governed by the same constraints. This usually means that only stars brighter than about magnitude 9.5 are shown. The great Bonner Durchmusterung or "BD" was an exception to this, since it showed stars to about 9.5 magnitude, however this atlas is long out of print.

In the second group the National Geographic - Palomar Atlas is far beyond the means of amateurs, even in groups, and is available only in large observatory or university libraries. Its limiting magnitude of about +20 means that frequently there are so many stars it is impossible to use. The two atlases by Hans Vehrenberg, while useful for many applications, and within the amateur's price range, have several flaws. The cameras used had a considerable fall-off in limiting magnitude toward the edges, and the photos vary widely in quality from one sheet to the next. Added to this is the fact that the photos were taken without the use of a filter, allowing the blue sensitivity of the plates to over-emphasize the bluer stars. This last feature renders these atlases of very little value to the visual observer since they just do not look like what he sees in the eyepiece.

The author of the new Photovisual Atlas has taken all of these factors into consideration. The primary purpose was to create an atlas showing the visual effect as seen through the telescope. To give maximum utility the limiting magnitude was set at 13^m5 so that even in congested areas of the Milky Way all stars would be seen as individual points. This limiting magnitude is also about the same as that reached by modest sized telescopes. The scale of 30mm per degree is such that the charts are easy to use, and no detail is lost in printing.

A set of carefully drafted clear overlays used with the centering marks on the charts facilitates object finding.

The camera used for the original photographs is a Zeiss Apochromat of f/6 focal ratio, and 625mm focal length, covering a useful field 11° square. Excellent definition and color correction are achieved to the very corners of the photographs. The special green filter used with the 103a Dplates gives an excellent match to the color sensitivity of the eye, assuring the best possible results in the final atlas. This filter was chosen by the author after taking into account the design features and glass types of the lens system and their effect on the color balance.

One minor problem that concerns primarily those interested in the far southern stars is the author's use of shorter exposures near the southern horizon to compensate for the relatively bright sky of his suburban Johannesburg location. This causes the limiting magnitude for that area of the sky to be noticeably less than the average for the rest of the atlas. This is a small matter when the overall excellence of the work is considered.

Volumes I and II are to be released soon. These cover respectively from the south pole to -30°, and from -30° to +30°, in a total of 336 charts. Each chart is printed with black stars on a white background on heavy stock about 15 inches square, and is identified by a chart number and the coordinates of the chart center.

The date and time of the exposure are given to assist in identifying any asteroids in the field. There are generous overlaps, the minimum being 1° along the equator. An index chart identifies the location of each chart and shows its position in relation to the constellations as well as the 1950 coordinate epoch for which the chart markings are drawn. The charts are boxed loose sheets for easy use.

This atlas should be of great value to anyone doing detailed work, and especially so to those of us engaged in AAVSO Chart making. When Clint Ford and I visited South Africa two years ago I agreed to complete the northern section of the atlas for Mr. Papadopoulos using his camera. This work is being done at Stamford Observatory in Stamford, Conn. As of this writing all necessary photographs have been taken. Enlarging the photos and marking of centers, etc. will start this summer and is to be completed by 30 Dec. 1977. It is hoped that Volume III will be ready for release by mid-1978. Meanwhile work is also proceeding on taking photos of the zone from $+30^{\circ}$ to -30° from Stamford so that original photo plates of that area will be directly available to the AAVSO.

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MAPPING THE SOLAR CORONA

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ABSTRACT

The largest object in the solar system is indisputably the solar corona. This fact alone justifies extensive investigations into the physical nature of the sun's atmosphere. However, the corona is also the outermost shell of the nearest star to Earth; as such, it is a reflection of the internal processes which govern all stars.

The author presents observations and a number of techniques used to interpret the physical conditions of the solar corona of June 30, 1973. Photographic photometry of calibrated eclipse negatives using a densitometer is explained, with regard to the author's determination of absolute intensities and electron densities in the corona. Several methods of producing isophotes (contours of equal intensity) from eclipse negatives are discussed, two of which were developed by the author. Finally, these isophote and false color maps are used to describe the overall conditions present in the 1973 corona.