

OBSERVING VARIABLE STARS WITH BINOCULARS

EDWARD G. ORAVEC
104 Bella Vista Street
Tuckahoe, NY 10707

In the past few years binoculars have become increasingly popular for astronomical observing. For over 30 years I have used hand-held binoculars for variable star work. The purpose of this discussion is to demonstrate that a viable program exists for variable star observing using binoculars.

When I began astronomical observing in the 1940's from New York City, conditions limited me to using only 7x50 binoculars. As my interests centered on the study of variable stars, I obtained all the available AAVSO charts of variables attaining 8th magnitude or brighter. This limited my program to a couple dozen stars visible at any one time. In catalogs I noticed numerous other bright variables not on the AAVSO program. I asked Mr. Campbell, who was Recorder of the Association at the time, if estimates of these stars would be useful to the AAVSO. He assured me they would, cautioning only that the star should vary at least half a magnitude. This added another hundred stars to my program. Charts were available for some, others were constructed using Yale and Boss catalogs for magnitudes of comparison stars. Later I discovered a number of these brighter variables had not been regularly observed since discovery. The magnitude range, period and even type I found differed from the listing in the catalog on some of these stars.

In 1951, I moved to a town in the suburbs, where I presently reside. With considerably improved sky conditions, I was able to reach thru 9th magnitude with 7x50 and 12x40 binoculars. The number of variable stars in my program increased considerably. As the suburbs became increasingly urban, sky conditions deteriorated. I was forced to obtain more powerful binoculars so my program would not be curtailed. After trying several types, I selected 16x70 binoculars. Under the best sky conditions at my home, the limiting magnitude of the 16x70's is 9.7. Away from the city, under excellent skies, I have seen 10.8 magnitude stars. Although the 16x70's weigh 5 pounds, I hand hold these while observing but do try to steady my arms on the armrests of a reclining beach chair when possible.

Using various types of hand-held binoculars, I have recorded a total of 463 different variable stars. Of these, 13 were novae, 6 Cepheids, about 150 long-period variables, the others semiregular or irregular types. Currently about 325 stars are in my observing program. I attempt to see as many different variables as possible each month, rarely seeing less than 100 stars. I attempt to keep a ratio of 2 to 1 or at most 3 to 1, between the numbers of estimates and stars. One criticism of binocular observing is the over-observing of brighter variable stars. This is true, so I try to diversify my program and follow lesser known stars. Of course the Cepheids and rapidly varying stars are watched nightly. In my card file listing all variables that attain 9.5 magnitude, over 100 stars are cataloged which I have not observed, mainly due to lack of charts or comparison stars. Here are a few of what I think are the worthwhile and interesting stars in my program not widely observed:

RY CAM (042164), semiregular, 136 day period, range 7.9 to under 9.5 magnitude. Appears on T Cam 'b' chart, 2° south of T Cam.

AA CAM (070468), irregular, seen to vary from 7^m5 to 8^m8, located 1° southwest of the cepheid RU Cam.

UW HER (171036), semiregular, 100 day period, range 7^m3 to 8^m6, found 1/2° south of π Herculis, (northeast star of the Keystone).

SV CAS (233451), semiregular with 276 day period, varies from 7.0 to under 9.6 magnitude, situated 3° west of R Cas.

Another criticism directed at binocular users is that the estimates are less valuable than those made with large instruments. In most instances, the estimates of a faint variable star require more time and effort than those of a bright star. This is acknowledged by credit for an "inner sanctum" observation in addition to the observers' totals. What matters, I feel, is the quality of the estimate and the stars selected for your program. Also, every observer should work when possible to the limit of one's instrument. If only the best-known and well-observed stars are selected, regardless of the instrument, the value of the estimate lessens. This is not to say that very well-observed stars like SS Cyg and R CrB should be dropped from anyone's program. It may erupt or fade on any one night, and you may be the only one observing the star. On the other hand, over-observing, like nightly estimates of a long-period variable, decrease the value of your program. I strongly feel all estimates, if they are carefully made, under a well planned program, regardless of the instrument, should be considered of equal value.

I hope I have demonstrated that there is more to observing the brighter variables than many of our members realize. I feel that all variable stars worth observing, regardless of their brightness, should be included in programs of AAVSO'ers.