

OBSERVER'S WORKSHOP
 AAVSO 76th Annual Meeting, AAVSO Headquarters
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 (Condensed From Tape)

Members of the Panel: Marvin Baldwin, Gerald Dyck, Clinton Ford,
 Wayne Lowder, Charles Scovil
 Moderator: Keith Danskin

Moderator: If anyone has any questions about telescopes or observing techniques, this panel will attempt to answer them, so please go ahead.

Q: What is meant by the "out-of-focus" method of estimating star brightness?

A: When I have a star that shows color, I often have a hard time determining its relative brightness by eye. If I track the telescope out of focus, I can do away with a lot of the color, so I use it on most stars that are bright enough. There was an article on this by Ernst Mayer in the Journal (1983, Volume 12). Going out of focus gives a fainter image and washes out the colors. If you try it on too faint a star, the star will disappear. If I use it on a star one night, I try to use it on that star all the time.

Q: How far do you go out of focus?

A: That depends on the brightness of the star. For example, U Cephei is fairly bright, and I rack it out of focus until the comparison stars all start meeting edge-to-edge. So, I am looking at big dishes, and I can tell by the density which is brighter.

Q: I sometimes find it makes a difference whether I go in or out when I put it out of focus. Do you?

A: No, I tend to do it either way.

A: You may have some astigmatism in your system, or a misalignment.

A: When the variable and the comparison are near the limit of my vision, I rack it out of focus and the one that disappears first is the fainter. That can be very helpful.

A: I often use the out-of-focus method with binoculars.

Q: Do you find that light-pollution filters help?

A: You should not use them in making variable star estimates. They will bias the color. They are narrow-band and you lose light depending on the color of the star. You should never use filters in making estimates. It has been tried and it doesn't work.

Q: Does that mean you shouldn't compare stars of different colors?

A: Right, but you can't always avoid it. That would be a time for the out-of-focus method. Or if you can close down the aperture you can get the image below the color threshold of your eyes.

Q: Some of the comparison star magnitudes on AAVSO charts are shown in parentheses, indicating photoelectric measures. Is there a standard correction we should apply in those cases?

A: No. We have a very unfortunate situation, in that we have a mixed bag, especially for SS Cygni. We have not put in a visual correction factor, and the individual observer should not do it either. That should be left for the final analysis.

Q: So we should try to stick to the visual magnitudes. One more question. Has anyone else complained about the sequence for T CrB, and can it be corrected?

Janet Mattei: Quite often when we have revised a chart we have found a few months later that the old one was better than the new. So we are very careful about it now. Before we revise anything, we will have it checked by a group of observers whose vision is not biased. This will be very difficult unless we can find an appropriate group of observers willing to do it.

A: For T Coronae Borealis, we adopted a photoelectric sequence and that brought in a few additional stars.

Q: I still like the old chart. Is it all right for me to use it, or will that cause a can of worms?

A: The worm is already in the can. Some people don't even know there is a new chart, so both are being used now.

Q: How much difference is there between the old and the new magnitudes?

A: Only a few tenths of a magnitude. So it's not terribly serious in this case, but those of us who have problems with charts ought to let them be known. If we keep our opinions private, it's not going to be very helpful.

Janet Mattei: By all means. I have a folder with critical comments and suggestions. It is getting bigger all the time, and some day we'll do something about it.

A: I'd like to make a general comment. You can also make use of other AAVSO publications in which observations are published and you can compare your work with that of the AAVSO average. Admittedly, this is difficult because of the publication time-lag, but it may help.

Q: I have often wondered if there are real systematic differences between observers. Has anyone had experience with this?

A: Six of us at Stamford Observatory did a summer-long study of X Cygni. Each observed it independently and we melded all the data into a single light curve. When it was plotted, I could see - although this is heresy - that different cycles were slightly early or late. One observer was as much as 0.5 magnitude above the average. He simply saw it brighter.

A: My own data on SS Cygni seem to be a few tenths of a magnitude brighter than the average. My data always come near the top of the scatter. That's a blue star, so I may be blue-sensitive.

A: Ideally, every observer ought to have an eye examination and then we could find out about the effect of astigmatism, color blindness, etc., and then we would know what we are talking about.

A: Unfortunately, we'd need a grant from the NSF for that. One night a friend and I compared our measures of ten stars. With the exception of one star, we were always within 0.2 magnitude of each other. Five times he was brighter and five times I was brighter, so we agreed very nicely.

A: Of course, one of the problems with long period variables is that the amount of light that shows up in the visual will vary from one maximum to another, because the color is sensitive to conditions in the star's atmosphere, among other things. We did a study of R Cyg and RT

Cyg during the 1950's that seemed to show variable brightness at maximum and the brightness didn't correlate with anything in our data. But there have been many data collected since then.

Janet Mattei: I'd like to know, when observers find that the chart is not ideal and doesn't quite fit what they see, how do they make an estimate?

A: An example of this sort of problem is CN Orionis, which has a star in its field that is not an official comparison star. But it is so handy that, over the months, I have established my own estimate of its magnitude by interpolating, and if necessary I will use it.

A: The essential point is that the sequence has to look right. If it doesn't, there is a problem. You have to compromise. You don't want to shift the zero-point, but if only one or two stars seem out of whack, then the process is straightforward.

A: Some of our sequences are composites derived from independent determinations, and they don't look good. I don't know what to do. Even professionally determined sequences sometimes disagree. Some of the older charts used to use BD-chart magnitudes, and those are easily 0.5 magnitude off to start with.

A: About 25 years ago, when I started, I used to make my own charts at the telescope. After a few months, I would take off some comparison star that didn't look right and gradually I'd get a sequence that looked all right. Then I'd come back next year, and things were all messed up again. So it becomes a matter of deciding when you are going to stop making corrections and live with what you have. And I am always in a hurry because I have too many stars on my list.

A: In some cases, I simply cross off a comparison star if it doesn't seem to fit the sequence. I don't use it.

Janet Mattei: We have one observer - a very good observer - whose data on dwarf novae often seem to stick out like a sore thumb. I was reluctant to take them out, and when I met him recently I learned his method. Whenever he has a sequence he doesn't agree with, he simply changes it to what he thinks is better. In one case a comparison star was changed from 10.2 to 10.9. This should not be done as it affects the standardization and homogeneity of the observations.

A: In one of my stars, EP Lyrae, I have photoelectric measures for the brighter part of the sequence, and I made my own estimates for the fainter part. But I haven't sent in any of the estimates yet, because I am waiting for someone to get a photoelectric sequence that goes all the way down. I think the French observers have a chart, and I'd love to get my hands on it. In another case, SS Geminorum, I simply made an a-b-c-d sequence estimated steps, which I am keeping until the magnitudes have been measured. So my solution is that I won't hand these data in until better sequences are available.

A: That would make a fine project for someone with a photometer, but they always seem to have their own projects.

Q: Is the photoelectric measure supposed to match the visual?

A: It was intended that the V band of the photoelectric measures would match the yellow-sensitivity of the visual. Unfortunately, this filter has a rather narrow pass-band and excludes the red and blue. The eye, of course, is sensitive to these other colors. Dick Stanton has studied this in great detail and has come up with a correction factor for any star for which we have blue B (blue) and V photoelectric measures. For an average star the correction from V to visual is about

0.1 magnitude, although it can be quite a bit larger for highly colored stars. Ultimately we might adopt V magnitudes for all of our charts.

Q: Would it be practical to keep track of the charts that were used for each series of estimates and then go back later and correct them [the estimates] when improved charts become available?

A: Theoretically, but not practically.

Q: In the editing process, does Headquarters adjust any estimates?

Janet Mattei: No, we occasionally discard, though.

Q: If I watch television before observing I find that the faint stars have disappeared completely.

A: Buy a radio.

Remark from a panel member: Eyepieces are extremely important. Some of the eyepieces supplied by telescope manufacturers are garbage. A good eyepiece can gain you as much as 0.75 magnitude because the image will be sharper. Forget orthoscopics as far as I am concerned. Erfle, Plossel, Nagler, these are all good. They can be expensive, but I think it's worth the cost. At low power it's not so critical.

Q: When I estimate a star with binoculars and then shift to my rich-field telescope, I very often get a different estimate. They may be as much as 0.5 magnitude apart. I am not talking about mistakes, but good estimates.

A: This may be an effect of seeing the star much brighter in one instrument than the other - a color effect coming in. Try observing the star out-of-focus.

A: When we are working near the limit of the telescope, the star will sometimes come and go. Then we should indicate that the estimate is uncertain. It can also be a function of seeing, as in planetary observing, when the details are glimpsed only briefly once in a while.

Q: What do you do on nights when the sky is flat and all the stars seem to be the same brightness?

A: I have an analogous problem occasionally, but it is usually late at night when I may be tired. That would be a good time to add a remark to the observing log.

Janet Mattei: These remarks are kept in the data files and are often helpful when we come to edit the data and plot them. We now have a column for remarks on the new reporting form and places to indicate the chart and comparison stars. Please be generous with your remarks.

Moderator: We have to wrap this up now. I want to thank everyone for participating.