

## Chapter 5 – PLANNING AN OBSERVING SESSION

### Making a Plan

It is recommended that you make an overall plan of observing, the first of each month, to determine before even going to the telescope on a given night, which stars you would like to observe and how you will find them. Further refinements can be made on the day you intend to observe. By planning ahead and being prepared, you will save yourself much time and frustration, resulting in a more efficient and rewarding observing experience.

### Choosing which stars to observe

One way to approach your planning session is to sit down with a list of stars you have chosen for your observing program and for which you have charts. Pick a date and time when you plan to observe, and ask yourself the following questions:

*Which of these stars are available for viewing?* A planisphere or monthly constellation chart can be very helpful for determining which constellations are visible to you at any given time, and in which direction you should look. Be mindful that these tools usually depict the night sky as if you could see down to the horizon in all directions. Depending on your observing site, your viewing area may be limited by obstructions such as trees, hills, or buildings.

Another way to figure out which stars are available for viewing is to use Table 5.1 to determine which hours of Right Ascension are overhead during the evening (between 9 PM and midnight local time) for the month you are observing. You can then choose stars in your program that have designations that begin with the same two first digits as the right ascension. (See pages 17-18 for more on variable star designations.) This is an approximation because the table is only for the 15th of the month. If observing past midnight, just expand the second entry of the RA range by the number of hours after midnight you observe. Also, Table 5.1 does not take into account that circumpolar constellations could be visible to you on any night, depending on your latitude.

*Are these stars bright enough for me to see?*

Predicted dates of maximum and minimum brightness for many of the long period variable stars in the AAVSO observing program are published each year in the *AAVSO Bulletin* (see pages 37-38 for more about the *Bulletin* and how to use this valuable tool). This can be a useful aid for obtaining an approximate brightness for a star on any given night. The experienced observer does not spend time on variables below his or her telescope limit. See pages 13–14 for information on determining your telescope's limiting magnitude.

Table 5.1 – *Observing Window*

The table below gives the approximate observing windows centered on the 15th of the month from 2 hours after sunset to midnight.

Month	Right Ascension
January	1 – 9 hours
February	3 – 11 hours
March	5 – 13 hours
April	7 – 15 hours
May	11 – 18 hours
June	13 – 19 hours
July	15 – 21 hours
August	16 – 23 hours
September	18 – 2 hours
October	19 – 3 hours
November	21 – 5 hours
December	23 – 7 hours

*When was the last time I observed this star?* There are certain types of variables which should ideally be observed no more often than weekly, while others should be observed more frequently. Using the information summarized in Table 5.2, and comparing this to your records of when you last observed a given star, should help you to determine whether it is time for you to look at it again or spend your time with another variable.

### Plotting the position of a variable

If your telescope does not have setting circles, it will be helpful for you to find the positions of the variables you have chosen to observe in a star

atlas. For all but the brightest variables, this is a necessary step toward locating the star using your telescope's finder or simply sighting along the tube. If you use the *AAVSO Variable Star Atlas*, most\* variable stars are already marked for you. If you use another atlas, chances are that the variables will not be indicated. If this is the case, you will have to use the position information given in the header of each chart to plot the star's right ascension and declination coordinates on the atlas. Make sure that the epoch of the position coordinates match the epoch of the atlas you use, or the position you plot will be wrong.

\*The *AAVSO Variable Star Atlas* includes all named variable stars with a range of variability exceeding 0.5 magnitude and a maximum brighter than visual magnitude 9.5. Also included, regardless of their magnitudes at maximum, are all other variables in the AAVSO and Royal Astronomical Society of New Zealand observing programs as of 1990.

Table 5.2 – Frequency of Observations for Different Variable Star Types

The table below was created to act as a guideline on how often variable star observations should be made for the various types of variable stars described in Chapter 3 of this manual. Due to the wide range of periods and magnitudes of variation from type to type, some stars lend themselves to more frequent observations than others. Cataclysmic variables, for example, should be observed frequently during outbursts because the brightness is changing so rapidly. Too frequent observations by one observer of stars that need observing weekly, such as Mira or semi-regular variables, however, could distort the light curve and the average of observations.

Type of Star	Observing Frequency
Cepheids	every clear night
RR Lyrae stars	every 10 minutes
RV Tauri stars	once per week
Mira variables	once per week
Semiregular	once per week
Cataclysmic Variables	every clear night
Symbiotic stars*	once per week
R CrB stars*—at Max	once per week
R CrB stars—at Min	every clear night
Eclipsing Binaries	every 10 minutes during eclipse
Rotating stars	every 10 minutes
Irregular variables	once per week
Suspected variables	every clear night

\*or every clear night to catch possible small amplitude pulsations with these stars.

Many AAVSO observers use computer software to plot variables, thereby creating their own finder charts. This flexibility affords any scale and virtually any limiting magnitude, but once again, it must be emphasized that any such charts can only be used as “finders.” All magnitude estimates should only be made using AAVSO Charts and the comparison star magnitudes given on these charts. This is essential for the standardization and homogeneity of variable star observations in the AAVSO International Database.

### A Typical Observing Routine

Each season, consider last year's program and whether to add stars to this year's. Download new charts from the AAVSO website or order them by mail as necessary. At the beginning of the month, make an overall plan of observing, according to instrumentation, location, anticipated time available, and experience. Use the *AAVSO Bulletin* to schedule long period variables, or the *MyNewsFlash* and *Alert Notices*, to include any new or requested objects. Check the weather forecast for a particular night. Decide what to observe that night—will you observe during the evening? Midnight? Early morning? Plan order of observations, grouping variables near each other together, and taking into account the diurnal motion of the night sky (i.e. the rising/changing order of constellations). Check to make sure you have the necessary atlas and charts for your observing targets and put them in observation order. Check equipment—red flashlight, etc. Eat a good meal for energy and concentration. Begin dark-adapting half an hour before going out (Some observers use red-filtered goggles or sunglasses). Dress warmly! At the start of the observing session, record in your log book the date, time, weather conditions, moon phase, and any unusual situations. As each star is observed, record designation, name, time, magnitude, comparison stars, chart(s) used, and comments in your log book. At the end of your nightly observing, make any necessary notes about the session overall. File the charts used so you can find them again next time. Enter your observations into your computer or transcribe them to your permanent record system, if necessary. If you would like to report some or all of your observations to AAVSO Headquarters right away, you may do so by following the procedures outlined in Chapter 6. At the end of the month, compile any additional observations not yet reported (by hand or by computer) to make your AAVSO-format report. Make and keep a copy of your report. Submit your report to AAVSO Headquarters as soon as possible after the first of the month.

## Useful AAVSO Publications

### AAVSO Bulletin

The *AAVSO Bulletin* is an essential tool in planning your observing session each month. This annual publication contains *predicted* dates of maxima and minima for about 560 of the more regular variables in the AAVSO program. In addition, there is a schematic representation which shows when a star should be brighter than magnitude 11.0 (denoted by a “+” symbol) or fainter than 13.5 (a “-” symbol) over the course of the year. This information will help you to determine if you can see a particular star with your telescope on any given night. A portion of the *Bulletin* along with an example of its use is given in Figure 5.3.

You might wonder; why should you observe the stars covered in the *Bulletin* if the AAVSO can already predict what they will do? The answer is that the predictions only serve as a guide to the *expected* maxima and minima dates. This may be helpful information when you are planning an observing session. Although long period variables are periodic most of the time, the interval between each maximum may not always be the same. In addition, individual cycles may vary in shape and brightness. By using the predictions and the light curves found in several AAVSO publications and on the AAVSO website, the observer can also see how rapidly the variable may be changing between maximum and minimum.

Another useful bit of information included in the *Bulletin* is a code which indicates how well a particular star is being observed. Those stars that are urgently in need of observation are so indicated. As you become more experienced with observing, and are looking to expand your observing program, you may wish to include some of the stars needing more observation.

### AAVSO Alert Notice

Headquarters will issue a special *Alert Notice* whenever a particular star shows unusual behavior, when an unexpected event such as the discovery of a nova or supernova is reported, or when there is a request from an

astronomer to observe a certain star in order to know when to schedule observations of it with a satellite or ground-based telescope.

*AAVSO Alert Notices* are available by email subscription (free-of-charge) or through the AAVSO website. They are also available via postal mail via subscription.

Figure 5.2 – Sample AAVSO Alert Notice

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS  
25 Birch Street, Cambridge, MA 02138 USA  
INTERNET: aavso@aavso.org  
Tel. 617-354-0484 Fax 617-354-0665

AAVSO ALERT NOTICE 308 (July 17, 2004)

**SUBJECT: 0409-71 VW HYDRI IN OUTBURST - UPDATE ON REQUEST FOR MONITORING**

AAVSO member and observer Rod Stubbings, Drouin, Victoria, Australia, has reported that the SU UMa-type cataclysmic variable VW Hyi is in outburst, as shown by his observations below. This outburst may be the superoutburst we have been waiting for, in our program to assist Dr. Knox Long and colleagues in planning their target-of-opportunity (TOO) observations with FUSE on this star. Please remember, however, that it is actually one of the outbursts after the superoutburst that will be used to trigger the TOO observations of VW Hyi.

*AAVSO Alert Notices 305 and 306* (please see for details) announced and discussed the request for optical monitoring of VW Hyi by Dr. Long. If the current outburst is a superoutburst, it is quite likely that the next outburst (a normal one) will occur early enough in the August FUSE observing window so the TOO observations can be triggered. The satellite needs time to monitor VW Hyi after it returns to minimum, so the placement of the outburst is critical.

As mentioned in *Alert Notices 305 and 306*, your observations of VW Hyi and your immediate notification of AAVSO Headquarters of an outburst are essential to the success of this observing program, and your observations to date have been of enormous value. Please continue to monitor VW Hyi closely and report your observations to AAVSO Headquarters. AAVSO 'b' and 'd' scale charts may be found at:

<http://www.aavso.org/cgi-bin/searchcharts3.pl?name=vw%20hyi>

or on request to AAVSO Headquarters.


Observations Reported to the AAVSO: Jul 1.3710 UT, <12.2, R. Stubbings, Drouin, Victoria, Australia; 4.3490, 14.1, Stubbings; 6.3610, <12.4, Stubbings; 15.5670, 14.1, Stubbings; 17.5380, 9.2, Stubbings; 17.5670, 9.0, Stubbings.

**SUBMIT OBSERVATIONS TO THE AAVSO**

We encourage observers to submit observations via our web site (online data submission tool WebObs), or by email in AAVSO format to [observers@aavso.org](mailto:observers@aavso.org). If you do not have AAVSO Observer Initials, please contact Headquarters so we may assign them to you. The answering machine at AAVSO Headquarters is on nights and weekends; use our charge-free number (888-802-STAR = 888-802-7827) to report your observations, or report them via fax (617-354-0665).

Many thanks for your valuable astronomical contributions and your efforts.

Good observing!



Elizabeth O. Waugen  
Interim Director

### MyNewsFlash

*MyNewsFlash* is an automated, customizable system for sending you variable star activity reports. The reports can be delivered via regular email or as a text message to your pager or cell phone. You can customize a report based on such criteria as star name, type, brightness, activity, date of observation, and more. The reports include observations of variable stars submitted electronically. To read more about *MyNewsFlash* or sign up to receive reports, please visit <http://www.aavso.org/publications/newsflash/myflash.shtml>.

Figure 5.3 – Sample AAVSO Bulletin

AAVSO BULLETIN 62 FOR 1999, CONTINUED

(2)

DESIGN.	NAME	RANGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
0003-39	V Sc1 #	<9.9-14.6>	-8m	11m	11m	14m	14m	22m	1m	1m	1m	1m	1m	1m	1m	1m
0004+51	SS Cas	<9.8-13.1>	11m	11m	14m	14m	14m	14m	1m	1m	1m	1m	1m	1m	1m	1m
*0009+28	UW And	9.6-(15.0)	16m?	16m?	16m?	16m?	16m?	16m?	13m?	13m?	13m?	13m?	13m?	16m?	16m?	16m?
0010+46	X And	<9.0-14.8>	18m	18m	18m	18m	18m	18m	18m	18m	18m	18m	18m	18m	18m	18m
0010-32	S Sc1	<6.7-12.9>	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m
*0014+44	VX And	7.9-9.6	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?
0017+55	T Cas	<7.9-11.9>	4m	4m	4m	4m	4m	4m	4m	4m	4m	4m	4m	4m	4m	4m
0017+26	T And	<8.5-13.8>	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m
0018+38	R And	<6.9-14.3>	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m
0018-62	S Tuc &	<9.3-14.5>	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m
0019-09	S Cet	<8.2-14.2>	25m	25m	25m	25m	25m	25m	25m	25m	25m	25m	25m	25m	25m	25m
*0022+30	YZ And #	10.1-15.9	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?	28m?
0024-38A	T Sc1 &	<9.2-13.0>	9m	9m	9m	9m	9m	9m	9m	9m	9m	9m	9m	9m	9m	9m
0025-46	T Phe &	<9.4-14.2>	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m
*0027+25A	TU And	<8.5-12.5>	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?	29m?
0031+79	Y Cep	<9.6-15.1>	20m	20m	20m	20m	20m	20m	20m	20m	20m	20m	20m	20m	20m	20m
*0031+62	TY Cas &	10.3-(16.5)	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?	13m?
0040+47	U Cas	<8.4-14.8>	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m
0041+32	RW And	<8.7-14.8>	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m	13m
0044+35	V And	<9.5-14.4>	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m
0044-35	X Sc1 &	<10.6-(14.2)	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m	16m
0045+33	RR And	<9.1-15.1>	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m	10m
0047+46A	RV Cas	<9.4-15.2>	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m	6m
0049+58	W Cas	<8.8-11.8>	15m	15m	15m	15m	15m	15m	15m	15m	15m	15m	15m	15m	15m	15m

U Cas is brighter than magnitude 11.0 (shown by the "+" symbols) from mid-January until the end of April 1999, with the maximum brightness predicted to occur sometime around the 6th of March.

S Tuc is predicted to be fainter than 13.5 ("-." symbols) from the last week in August until the end of October. Minimum brightness is expected to occur October 8th. The "&" symbol next to the star name, means that more data is urgently needed on this star.

# - needs more data    & - needs more data urgently    @ - needs more data very urgently