Chapter 6 – PLANNING AN OBSERVING SESSION

Making a Plan

It is recommended that you make an overall plan of observing, on 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, monthly constellation chart, or planetarium software 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 6.1 to determine which hours of Right Ascension (RA) 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 the same hours of RA as those given in the table. 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 6.1 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 page 39). 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 17–18 for information on determining your telescope's limiting magnitude.

Table 6.1 – *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 (Hours)
January	1–9
February	3–11
March	5–13
April	7–15
May	11–18
June	13–19
July	15–21
August	16–23
September	18–2
October	19–3
November	21–5
December	23–7

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 6.2, 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.

Table 6.2 – *Frequency of Observations for Different Variable Star Types*

"How often should I observe my program stars?" The answers depend largely on the type of stars you are observing. The following table is a general guideline. As you learn more about the different types of variables, and the personalities of some of the specific stars you choose to observe, you may decide to observe them more or less often than suggested here.

Variable Type	**Cadence in days**
Active Galaxies (AGN)	1
Dwarf Novae (NL, UG, UGSS, UGSU, UGWZ, UGZ)	1
Gamma Cassiopeia (GCAS)	5-10
Irregular	5-10
Miras (LPVs) period <300 days	5-7
Miras (LPVs) period 300-400 days	7-10
Miras (LPVs) period >400 days	14
Novae (N)	1
R Corona Borealis (RCB)	1
Recurrent Novae (NR)	1
RV Tauri (RV)	2-5
S Doradus (SDOR)	5-10
Semi-Regular (SR, SRA, SRB, SRC)	5-10
Supernovae (SNe)	1
Symbiotics (ZAND)	1
Young Stellar Objects (YSOs) active state	1
Young Stellar Objects (YSOs) inactive state	2-5

Observers following eclipsing binaries, RR Lyrae and UGSU in outburst should consult the section leaders for the preferred cadences for time-series type observations of these stars. You may need to observe them from every 30 seconds to every ten minutes depending on the type of variable and its period.

A Typical Observing Routine

Each season, consider last year's program and whether to add stars to this year's. Create new charts using the AAVSO Variable Star Plotter (VSP).

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 an 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. 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. Submit your observations to AAVSO Headquarters using WebObs (see Chapter 7 for more on how to do this).

Useful AAVSO Publications

AAVSO Bulletin

The *AAVSO Bulletin* is a useful tool in planning your observing sessions. This annual publication contains *predicted* dates of maxima and minima for 381 long period and semiregular variables. This information will help you to determine if you can see a particular star with your telescope on any given night. The *Bulletin* is available for download on the AAVSO website: https://www.aavso.org/aavso-bulletin

In addition to the static .pdf version of the *Bulletin*, there is an intereactive web version called "The Bulletin Generator" which allows the user to request maxima/minima dates for a subset of stars, a constellation, a month, a RA and/or Dec range, as well as the entire *Bulletin* dataset. Data may be retrieved as a .pdf file, an html table, or a comma-separated file (CSV) suitable for loading into a spreadsheet.

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. The Bulletin Generator includes a field "N" which indicates how many observations of that star were made during the prior year so you can use that information to make a judgement for yourself.

AAVSO Alert Notice

AAVSO Headquarters will issue an *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: https://www.aavso.org/observation-notification#alertnotice

AAVSO Special Notice

The *AAVSO Special Notice (ASN)* will include announcements on interesting and/or rare stellar activity that do not involve new coordinated campaigns. The goal is for the *ASN* to be quick and brief. Should the announcement warrant further attention, it may be followed by an *Alert Notice.*

AAVSO Special Notices are available by email subscription (free-of-charge) or through the AAVSO website: https://www.aavso.org/observation-notification#specialnotices/

MyNewsFlash

MyNewsFlash is an automated, customizeable 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 https://www.aavso.org/observation-notification#mynewsflash