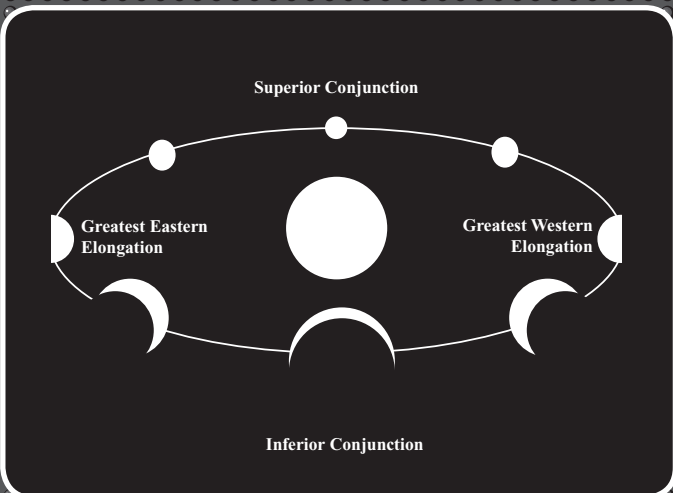




REQUIREMENTS - Owing to the dazzling brilliance of this planet a 75mm refractor or 100mm reflector will be adequate for basic work, although larger apertures will give better resolution. A long focal length reflector is preferable.



APPARITIONS - Since it is an inferior planet Venus will show phases as it orbits the Sun and will vary in angular size from 9" to 60". It is at its brightest 35 days before maximum Western elongation and 35 days after maximum Eastern elongation. The elongations are never greater than 47° from the Sun. A synodic cycle (full Venus to full Venus) lasts 584 days. This was the basis of one Mayan calendar. Venus is observable for some 7 months around each elongation.

Forthcoming apparitions are:

2004	Mar 29	16:39	46° 00' 16"	East
2004	Aug 17	18:31	45° 48' 58"	West
2005	Nov 03	19:33	47° 06' 10"	East
2006	Mar 25	06:44	46° 31' 49"	West
2007	Jun 09	02:44	45° 23' 27"	East

SURFACE FEATURES - Sadly the surface of Venus is perpetually obscured by dense white clouds, so any observations will be limited to details discernible in this rather bland covering. In ultraviolet light, detailed cloud patterns emerge which have a characteristic 'Y' shape, but visually any features tend to be vague and of low contrast.

TERMINATOR - This is especially worth scrutinising for its general shape and presence of any irregularities caused by cloud features.

The deviation of the observed dichotomy from predicted half phase - the *Schröter Effect* is still poorly understood, but seems to vary from one apparition to another. When Venus is waning (evening star) dichotomy is always early, whereas a waxing (morning) Venus shows a late dichotomy, often by as much as a few days. Valuable information can be contributed by amateurs here.

THE ASHEN LIGHT - If an occulting bar (see over) is used to reduce the glare of the lit side of the planet, some observers have reported the dark side to have a soft luminance, possibly connected with electrical activity or auroral effects. This is little understood at present, so any observations are of scientific worth.

RECORDING OBSERVATIONS - Despite the varying size of the disc as seen from Earth, it is best to prepare a standard 50mm blank for recording visual details.

Due to the overwhelming glare of Venus (it can attain mag -4.4) the best time to observe it is in the twilight against a light background which will enable low contrast features to be seen better. Other aids to reduce glare are: neutral density eyepiece filters; ocular diaphragms; reduction in telescope aperture; Herschel wedge or sun diagonal; presence of high level haze or cloud.

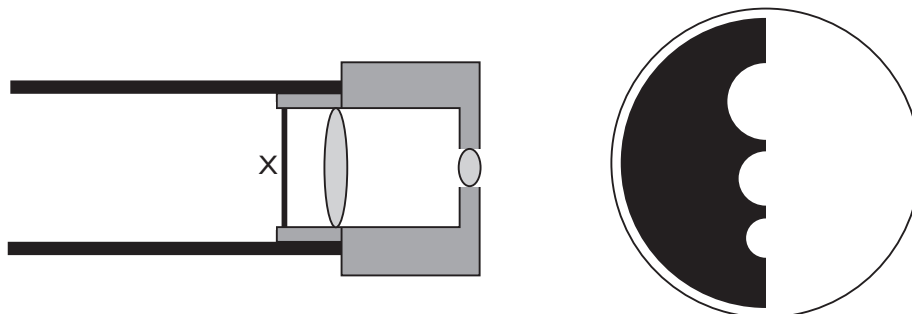
Look carefully for any irregularities in the cusps (widening or blunting, unequal sizes). Is the terminator sharp or shaded? Is it uniform as you view from North to South? Are there any variations in colour or lighter spots within the shaded zone?

Try to record the phase as accurately as you can by concentrating on the maximum thickness of the illuminated portion compared with the diameter of the disc. This can be estimate as a percentage.

How does the observed dichotomy compare with that predicted from almanacs?

What markings are visible in the upper cloud layers? - these should be sketched with great accuracy and attention to detail. Extended grey areas should be accurately smudged in after outlining their extent.

THE ASHEN LIGHT EYEPIECE is designed to obscure the illuminated side of Venus in order to compare the brightness of the dark side with the surrounding sky. The occulting half stop can be cut out of foil - the most accurate are etched and placed at the field stop (X)



PHOTOGRAPHY - If you are planning to photograph Venus, eyepiece projection will give the largest image on the film. For an f80 system a typical exposure time should be about 0.1 sec using 200 ASA film. For a 150mm aperture this gives an image size of 0.58 - 3.7 mm on the film. A 300mm instrument will double this. Obviously, placing a small image on one complete frame is wasteful and various film winding systems have been devised to put as many as 100 images on a standard film roll. As with all planetary photography, increased aperture leads to better results, although the recorded detail will always be inferior to visual observations.

Low-transmission filters increase contrast and definition while limiting the effects of irradiation. For Venus, Wratten blue (W38A) and violet (W47) filters are useful for uncontrasted detail, mainly because of the yellowish atmospheric cloud layer.

Alternating color variations from red to blue are frequently detected in the south polar region of Venus using Wratten red (W23A or W25), yellow (W12 or W15), and green (W57 or W58) filters. Variable-density polarizing filters add to the visibility of faint markings by reducing glare.

There is much more detail in the ultraviolet than the visible, so in this case uv photography will offer enhanced scientific results, but requires specialised filters (the Pilkington OX9A is to be recommended) and film.

AUXILIARY DATA - The following details should be added to the drawing or photograph:

- Date (written year, month, day)
- Time (UT) when outlines were completed
- Approximate altitude of planet at the time
- Aperture and magnification of the telescope, together with any details of accessories
- Seeing conditions (Antoniadi)
- Location of observer
- Name of observer

FINDING BY DAYLIGHT - There are three methods for doing this:

- (i) With setting circles using the RA and dec obtained from an almanac/planetarium program.
- (ii) When Venus is east of the Sun, work out how far above or below the Sun it is from its declination at that time and work out how many fields of view this is for your telescope. Starting at the Sun (NEVER by direct observation - always use eyepiece projection) move the telescope up or down at right angles to the direction of motion of the Sun for the appropriate distance. Next work out the difference in RA between the Sun and Venus as a time interval and wait for exactly this time. Venus should be in view.
- (iii) If the Moon is visible, work out the difference in RA and dec between it and Venus and using a low power eyepiece or wide angle finder, sweep in the required direction to find it.