A.L.P.O. Venus Section

Visual observations of the planet Venus should be carried out in a cooperative systematic research program to maximize opportunities for useful scientific contributions. In the A.L.P.O. Venus Section, our objective is to observe Venus on every possible clear night throughout an apparition of the planet, which runs from conjunction to subsequent conjunction with the Sun. Venus is an inferior planet, meaning that it has a smaller interior orbit to that of the Earth, and it exhibits phases just like the Moon. Because Venus is comparatively near the Sun, it is characteristically very bright, and the high albedo produces an excessive amount of glare. The rather faint and elusive markings on the disk of Venus, normally of very low contrast, become difficult to see as a result. Considerable controversy exists over the true nature of these dusky amorphous or somewhat streaky atmospheric features. It is not at all unusual for two observers, working on the same date with comparable instrumentation, to see striking dissimilar atmospheric phenomena on the planet.

Even though Venus may reach a maximum angular distance from the Sun of around 47°, the planet is still observed near the times of sunrise or sunset. If Venus is seen against a dark sky, the effects arising from the excessive brilliance of the disk are pronounced. At eastern (evening) apparitions, Venus is frequently low in the western sky where the effects of atmospheric differential refraction and prismatic dispersion destroy good image quality. Seeing conditions are so poor at such times that most observers have adopted a practice of viewing Venus only when has an altitude of $\geq 20°$ above the horizon. At times of western (morning) apparitions, it is possible to wait until the planet gains altitude and the background sky brightens considerably, and Venus can readily be followed into daylight. It is perfectly desirable to observe Venus during daylight hours when most of the prevailing glare associated with the planet is gone or reduced, but observing Venus too far into the daylight hours can become a problem as solar heating produces turbulent air and resulting poor seeing. While it may seem difficult to look for Venus in daylight, it should be recalled that the planet is comparatively bright, and in practice, the observer can usually find Venus if knowledge of exactly where to look is obtained before the observing session. It is worth mentioning that observers find that the presence of a slight haze or high cloud often stabilizes and reduces glare conditions while improving definition.

Widely-spaced observations are of very little value, and we must stress the important point of striving for systematic, regular studies carried out by a large team of experienced, dedicated individuals using similar equipment and methods. We are seeking an intensified effort to increase the incidence of simultaneous identification of atmospheric phenomena on Venus to improve the objectivity of our data, chiefly because of the elusive nature of features in the atmosphere of the planet.

With the highest optical quality and mechanical stability assumed, the minimum recommended aperture for useful observations of Venus and participation in all aspects of our programs is about 15.2 cm. (6.0 in.) for reflectors and 7.5 cm. (3.0 in.) for refractors. When observing with smaller apertures, one must seek a suitable combination of large angular diameter of Venus and large phase for successful detection of the elusive disk features. This combination of factors occurs about midway between the times of greatest western elongation and superior conjunction, as well as between superior conjunction and greatest eastern elongation. During these intervals, one may note that Venus has an angular diameter of approximately 16″.0 and a gibbous phase. Use of magnifications within the range of about 50*D* to 80*D* (where ***D*** is the diameter of the telescope in inches) is often practical when Venus is high in the sky.

It is important not to overlook various accessories that come with or are purchased to accompany one's telescope. Eyepieces need to be of equal quality as the main optical system of the instrument, and filters of known wavelength transmission must always be used in conjunction with eyepieces employed for observations. Admittedly at the cost of a little comfort and convenience, one should avoid using diagonals or any devices that orient the image of Venus contrary to what is normally seen and adopted as the view of a planet through an astronomical inverting telescope. 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. Once at the telescope, there can be no substitute for actual observing, and as we shall see, it is just as vital to report negative results (no markings) as it is to record features that are present. The fundamental goal is objectivity and realism.

Utilization of the appropriate drawing blanks and report forms is required by the A.L.P.O. Venus Section if participants in our program expect to have their data included in our analysis and subsequent apparition reports. If observers wish to have drawings considered for publication, they must be submitted as originals rather than xerox copies. Forms are available at the cost of reproduction and postage from the A.L.P.O. Venus Section.

It is the ultimate goal of the A.L.P.O. Venus Section to attempt to assemble a completely homogeneous mass of accurate, reliable observational data collected over many apparitions, permitting an exhaustive statistical analysis. It is hoped that we might derive enough from painstaking observations and analysis to help provide some answers to questions that continue to perplex us about Venus.

Observations of the atmosphere of Venus are organized into the following routine programs:

1. Visual observation and categorization of atmospheric details in dark, twilight, and daylight skies.

2. Drawings of atmospheric phenomena.

3. Observation of cusps, cusp-caps, and cusp-bands, including defining the morphology and degree of extension of cusps.

4. Observation of dark hemisphere phenomena, including monitoring visibility of the Ashen Light.

5. Observation of terminator geometry (monitoring any irregularities).

6. Studies of Schröter's phase phenomenon.

7. Visual photometry and colorimetry of atmospheric features and phenomena.

8. Routine photography (including UV photography), CCD imaging, photoelectric photometry, and videography of Venus.

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9. Observation of rare transits of Venus across the Sun.

10. Simultaneous observations of Venus.

Complete details can be found on all of our observing programs in the ***A.L.P.O. Venus Handbook***. Individuals interested in participating in the programs of the A.L.P.O. Venus Section are cordially invited to contact:

Dr. Julius L. Benton, Jr.
Coordinator, A.L.P.O. Venus Section
ASSOCIATES IN ASTRONOMY
305 Surrey Road
Savannah, GA 31410
E-Mail: jlbaina@aol.com
E-Mail: jlbentonaina@msn.com
(912) 897-0951