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WATCH
August 29-September 05

See the phases of Venus

ज्योतिर्विद्या परिसंस्था
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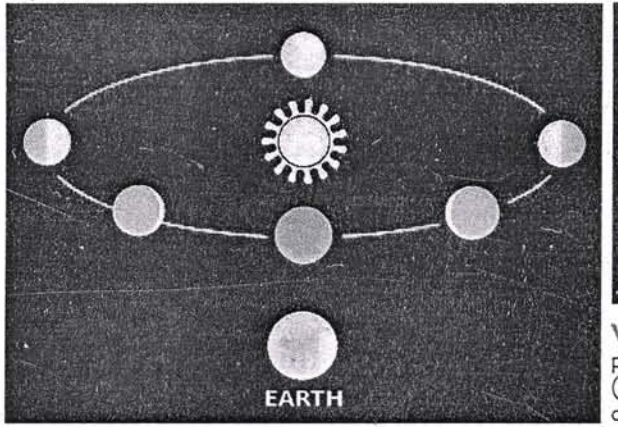
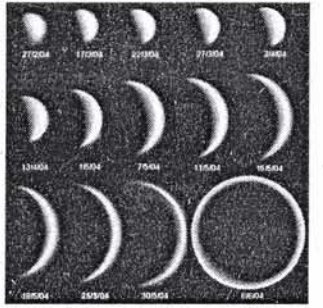
Venus is now visible, shining in the evening sky, and its brightness is increasing every passing day. On 20th August Venus was at its Maximum Eastern Elongation and now it is moving closer and closer to the Earth. In the coming days it will be possible to see the beautiful phases of Venus.

The phases of Venus results from the planet's orbit around the Sun inside the Earth's orbit, and this provides people observing with a telescope, a sequence of progressive lighting similar in appearance to the moon's phases.

It presents a full image when it is on the opposite side of the Sun. It shows a quarter phase when it is at its Maximum Elongation from the Sun. It appears as a thin crescent in telescopic views as it comes around to the near side between the Earth and the Sun. And it presents its new phase when it is between the Earth and the Sun.





VENUS BEAUTY: The various phases of Venus.
(Left) Diagramatic representation of Earth, Venus and the Sun.

Since Venus has an atmosphere it can be distinguished through a telescope by the halo of light refracted around the planet. The full cycle, from new to full to new again, takes 584 days (the time it takes Venus to overtake the Earth in its orbit).

The planet also changes in apparent size from 9.9 arc seconds at full (superior conjunction) up to a maximum of 68 arc seconds at new (inferior conjunction). Venus reaches its greatest brilliancy (magnitude 4.6) when it is an intermediate crescent shape at the point in its orbit when it is 68 million kilometres away from the Earth (a combination of its closeness and the fact that it is 28 per cent illuminated).

The first known observations of the full planetary phases of Venus were by Galileo at the end of 1610 (though not published until 1613). Using a telescope, Galileo was able to observe Venus going through a full set of phases, something prohibited by the Ptolemaic system (which would never allow Venus to be fully lit from the perspective of the Earth or more than semi-circular). This observation essentially ruled out the Ptolemaic system, and was compatible only with the Copernican system and the Tychonic system and other geo-heliocentric models such as the Capellan and Riccioli's extended Capellan model.

The extreme crescent phase of Venus can be seen without a telescope by those with exceptionally acute eye-sight, at the limit of human perception. The angular resolution of the naked eye is about 1 minute of arc. The apparent disk of Venus' extreme crescent measures between 60.2 and 68 seconds of arc, depending on the distance from Earth. Nevertheless it is possible for observers with extremely acute eyesight to see a crescent Venus under ideal atmospheric circumstances. Right now we can see Venus as an apparent disk of 26.8 seconds of arc. By end of September this size will be 45 seconds of arc and on 30th October the apparent disk size of Venus will be 61.5 seconds of arc.

There have been numerous reports stating such observations. The phases of Venus are alleged to have been seen in Mesopotamian times by priest-astronomers. Venus is described in cuneiform text as having horns. However, other Mesopotamian deities were depicted with horns, so the phrase could have been simply a symbol of divinity.

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