

Venus Transit Across the Disk of the Sun

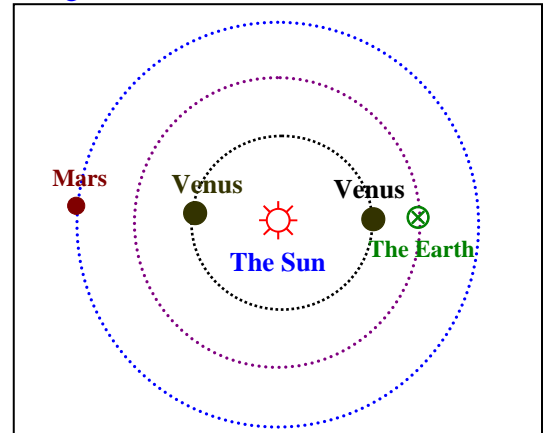
It is expected to have a planet and the Sun on one side of the Earth since planets go around the sun including the Earth. The configuration of that planet is called a conjunction, whereas when a planet and the Sun are on opposite sides of the Earth it is called an opposition. In conjunctions, all planets may pass directly behind the Sun where such a configuration is called an occultation, but Planets nearer to the Sun than the Earth (inner planets) also may pass directly in front of the Sun as observed from the Earth, where such a configuration is called a **transit**.

Mercury and Venus are inner planets, therefore they can be observed in transit across the Sun (Figures 1 & 2). Mercury revolves the Sun faster than Venus does, then its frequency of transit occurrence is higher than that of Venus. Mercury transits the Sun once in about eight years (between 3 and 13 years) whereas Venus takes longer. The last two transits of Mercury were on 7 May 2003 and 8 November 2006 and the next one will be on 9 May 2016. The last two transits of Venus were on 6 December 1882 and on 6 June 2004. According to calculations and long term observations of the frequency of transit occurrences, Venus transits the Sun's disk once in about 8, 122, 8, 106, 8, ... years respectively. The expected transits of Venus for the coming 250 years are middle of year 2012, end of year 2117, end of year 2125, middle of year 2247, and middle of year 2255.

In a transit of a planet across the Sun, it is possible to observe the disk of the planet as a small dark circle crossing the Sun's disk by using a special eye protection glasses or a solar filtered optical device (Figure 2).

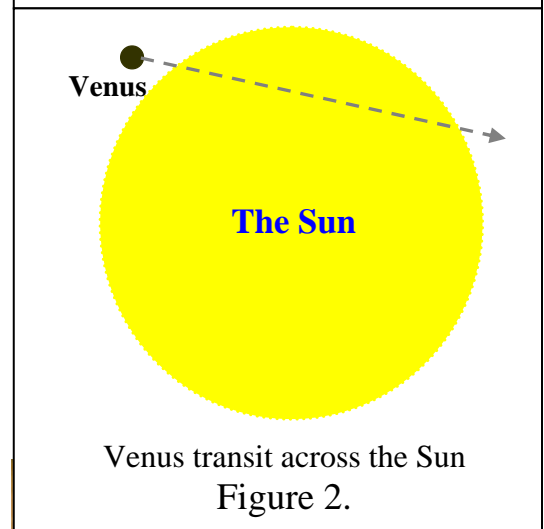
On Tuesday 5 June 2012 at about 22:10 and ends On Wednesday 6 June 2012 at about 22:10 and GMT, planet Venus will transit the Sun (Figure 3). Of course, for the phenomenon to be observed in a location it should occur during the daytime where the Sun is visible. Some stages of the transit will be visible around the world, except middle and western regions of Africa, Spain, Portugal, middle and southern regions of South America. The entire transit phases will be visible in middle and western regions of Australia, Japan, middle and eastern regions of China, middle and northern regions of Canada, Alaska, and Hawaii (see the map below).

The stages of the transit of Venus across the Sun according to Saudi Arabian time will occur as follows: The transit will start at 1:08 am, middle of the transit will be at 4:33 am, and Venus clears the Sun's disk at 7:55 am. Since the sunrise in all parts of Saudi Arabia will be after 4:40 am, then only some phases will be observed and the duration will decrease as we go to the west (Sunrise in Dammam, Riyadh, Makkah, and Madinah are: 4:46 am, 5:03 am, 5:37 am, and 5:32 am, respectively).



Mars in conjunction (occultation) and Venus in two positions of conjunction (occultation and transit)

Figure 1.



Venus transit across the Sun

Figure 2.



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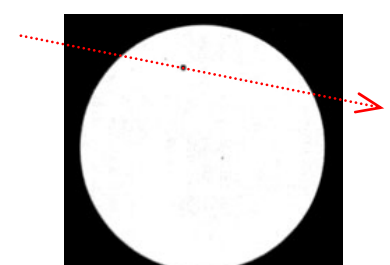


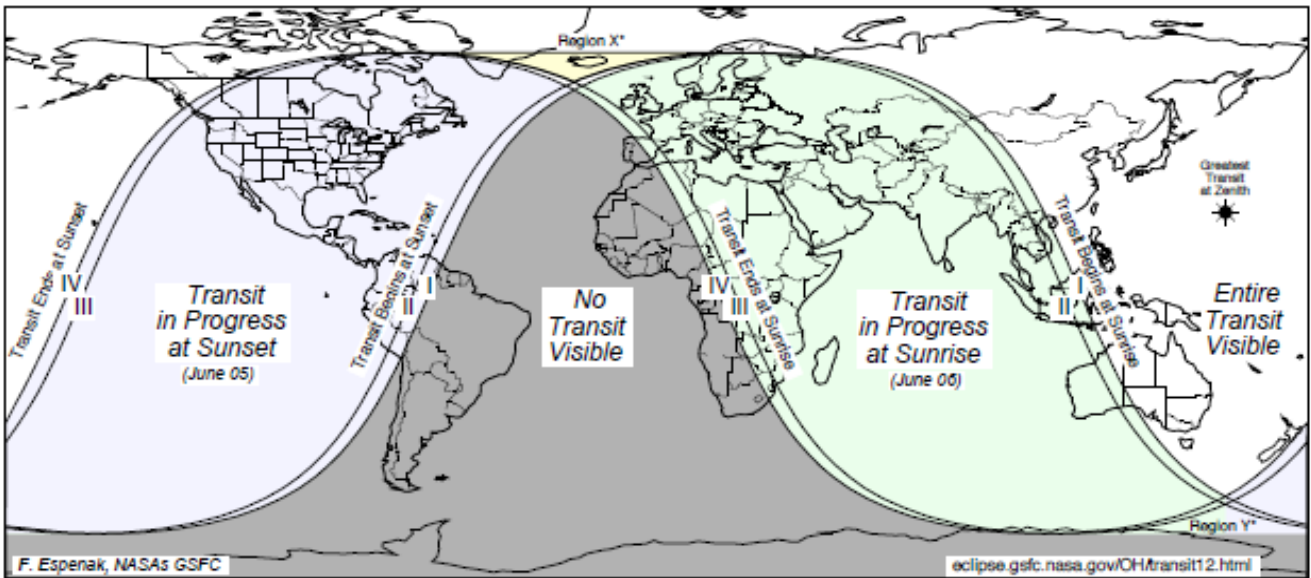
Figure 3

WARNING: the Sun's light must be filtered to reduce its luminosity one hundred thousand times in order to avoid damage to the eye. You must be extremely careful because without proper protection there is a real risk of burning the retina and causing complete blindness.

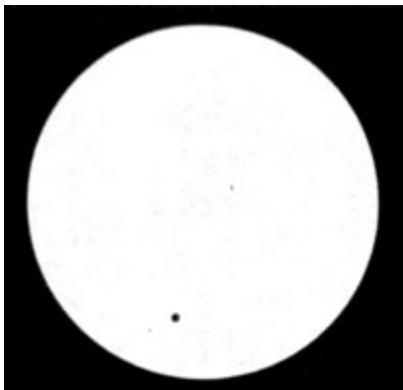
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Reference: NASA Eclipse Web Site: Planetary Transits Across the Sun
<http://eclipse.gsfc.nasa.gov/transit/transit.html>
<http://eclipse.gsfc.nasa.gov/transit/venus0412.html>
Fred Espenak, "Eclipse During 2012," **Observer's Handbook 2012**,
<http://eclipse.gsfc.nasa.gov/OH/transit12.html>
Royal Astronomical Society of Canada
<http://www.theprovince.com/technology/Venus+cross+Tuesday+last+time+virtually+lives/6722951/story.html>

Global Visibility of the Transit of Venus of 2012 June 05/06



* Region X - Beginning and end of Transit are visible, but the Sun sets for a short period around maximum transit.
* Region Y - Beginning and end of Transit are NOT visible, but the Sun rises for a short period around maximum transit.



Photograph of the Transit of Venus on 1882 Dec 06. Taken by students at Vassar College (Sky & Telescope Feb. 1961).