

TRANSIT OF VENUS 2012

Experience one of the rarest marvels of our Solar System

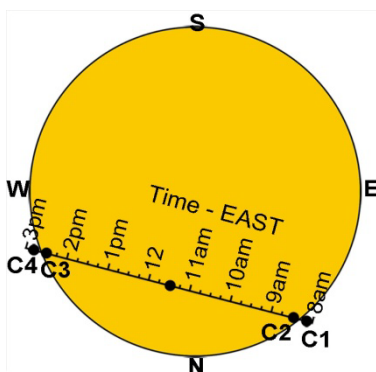
On 6 June 2012, the planet Venus will pass directly between the Earth and the Sun, appearing as a small black disc slowly moving across the Sun. This rare event has only occurred 6 times since 1639 and this year's Transit will be the last in our lifetime.

What is a Transit of Venus?

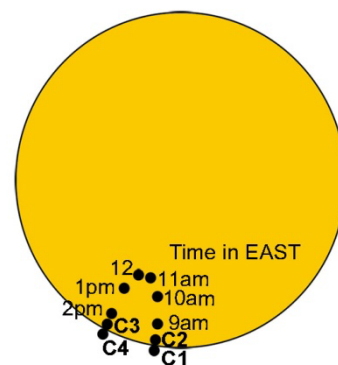
A Transit occurs when a planet, in its orbit, passes directly between the Earth and the Sun. Whilst the Moon can block out the Sun entirely during a Solar Eclipse, because Venus is further from the Earth than the Moon, it appears much smaller like a black hole or disc during its Transit.

What will we see?

Venus will take about 6 hours to move across the Sun travelling in a straight line in its orbit, but because the Sun appears to rotate as it crosses our sky, Venus, as seen from Australia will appear to move in an inverted "U" shape. The 2012 Transit will be best seen from eastern and central Australia.



Transit of Venus 6 June 2012
View not accounting for Sun rotation



Transit of Venus 6 June 2012
View accounting for Sun rotation

Interesting Facts

Transits of Venus occur in a pattern that repeats every 243 years. Recorded observations have been in 1639, 1761, 1769, 1874, 1882 and 2004. The next one after 2012 is due in 2117. Venus actually passes between the Earth and the Sun about every 19 months, but we don't see it "transit" across the Sun as it's orbital path is above or below it.

Observations of the Transits of Venus in 1761 and 1769 made a significant impact in calculating the size of the solar system and the universe by applying Kepler's 3rd law of planetary motion. Astronomers sailed the globe to make observations, such as James Cook who was sent to Tahiti on HMS Endeavour to observe and record the transit in 1769. After this transit, he charted the east coast of Australia.



Surveying skills were an essential element of early Transit of Venus expeditions, not only to identify the exact location for making observations, but to later undertake the mathematical analysis.

Astronomy, Surveying and Spatial Science

Astronomy is the oldest of the natural sciences dating back to ancient Chinese and Babylonian civilizations. It can be defined as the science that deals with the universe beyond the Earth.

Navigators, Explorers and Surveyors have used Astronomy for determining the positions of navigation points on the Earth (latitude and longitude). Early Surveyors, not only had skills in Navigation and Mapping, they also had specialist knowledge of Mathematics and Astronomy.

Over the years, the work of Surveyors using Astronomy has been greatly simplified by technological improvements and techniques. The need for the practical application of field Astronomy in Surveying has now shifted emphasis to Spatial Science tools, as earth satellites (Global Positioning System or GPS) are now generally used for determining location.



Experiencing the Transit

Never look directly at the Sun during the Transit as you may cause serious and permanent damage to your eyesight. Safe viewing options include:

1. SolarScope – a projection device suitable for groups of people to view simultaneously (as shown in image).
2. Webcast on www.transitofvenus.com.au – watch in real time or replay the webcast. Perfect if it turns out to be a cloudy day at your viewing location.
3. Binocular or telescope projection – but you must observe safety precautions.



See www.transitofvenus.com.au for more details on safe viewing of the Transit.

Teaching resources including software and student exercises relevant for maths and science curricula are also available for download at www.transitofvenus.com.au. For more information, contact info@transitofvenus.com.au.

SolarScope School Competition

Win 1 of 100 SolarScopes for your school

Enable your students to experience this extraordinary event with a free SolarScope and student exercises.

Safe viewing of the Transit of Venus can be done with the use of a SolarScope. Enter this simple competition to win a free SolarScope, or purchase one for \$80 (valued at over \$150).

How to enter

1. Use the Stellarium astronomical simulation computer program to predict the time of the 2nd contact of the Transit of Venus at your School. All you need to do is determine the Latitude and Longitude of your School and use Stellarium to simulate the Transit of Venus at your location. You can then determine when the 2nd contact will occur. Download the Stellarium program and the Transit of Venus – A simulation program student exercise via www.transitofvenus.com.au for complete instructions.

2. Enter your answer and the School's details online at www.transitofvenus.com.au

What you get

Winners will receive a free SolarScope in May 2012. Maths and Science student exercises relevant to Surveying and Astronomy are available for download under the "Resources" section of the website. A Land Surveyor will be available to personally deliver the SolarScope, instruct the class on its use and can run a short practical exercise to demonstrate Surveying concepts used in maths, industrial design and CAD applications (subject to local availability).

Who can use a SolarScope

Students can safely view the Transit of Venus outside using a SolarScope. Small groups of students will be able to observe the projection simultaneously. Should cloud cover affect visibility of the transit, the SolarScope can also be used for such activities as observing sunspots, determining the rotation speed of the Sun and safely observing Solar Eclipses.

Terms & Conditions

The first 100 entries to correctly predict the 2nd contact time of the Transit of Venus for their School will receive a free SolarScope. One free SolarScope may be won per School (includes all campuses under that Brand). Entries close 15 March 2012. Winners will be notified via email in the first week of April 2012, after which time all entries will be invited to purchase a SolarScope for \$80. The competition is open to all Primary and Secondary Schools across Australia.

Acknowledgements

Transit of Venus Australia 2012 is a joint educational project of The Surveying and Spatial Science Industry, Astronomical Association of Qld (AAQ), Science Teachers Association of Qld (STAQ), contributing Teacher and Surveyor Volunteers Australia-wide. Thank you to our sponsors for helping youth to be a part of this amazing event.



www.transitofvenus.com.au