

_____ Days Until the 2012 Transit of Venus

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What is a transit of Venus?

When Venus, on the inside orbit, passes directly between earth and the sun, the silhouette of Venus appears as a small dot that moves (“transits”) across the solar disk. The 2012 transit of Venus begins Tuesday, June 5. Details at www.transitofvenus.org.

Why is a transit of Venus significant?

Historically it was an opportunity to quantify the size of the solar system. Edmond Halley suggested one could mathematically determine the Astronomical Unit (A.U.) by having observers time the duration of the transit of Venus from known locations across the earth. International expeditions set out in the 18th and 19th centuries in a cooperative effort to answer the leading question of the day--how big is the solar system?

Today, seeing a transit of Venus is like having a front row seat to the leading edge of astronomy. Astronomers observe planets transiting distant stars in a quest to find habitable planets. The NASA Kepler spacecraft is accelerating the pace of discovery as it monitors over 150,000 stars simultaneously and detects periodic dips in brightness that give away the presence of a planet.

Is the transit of Venus safe to watch?

You are looking at the sun, so take precautions to protect your eyes. For eye safety see <http://www.transitofvenus.org/june2012/eye-safety>. Safe techniques include:

- rear screen projection
(http://cdn.transitofvenus.org/docs/Build_a_Sun_Funnel.pdf)
- solar shades
- #14 welding glass
- solar filters on telescopes
- hydrogen alpha telescopes

Global webcasts will broadcast live images of the ongoing transit with commentary. The Solar Dynamics Observatory and other spacecraft will be

positioned to image the 2012 transit of Venus. NASA's Sun-Earth day website is loaded with resources at <http://sunearthday.nasa.gov>.

Note: the disk of Venus is about one arcminute across, or 1/30th the apparent diameter of the sun. This is near the limit of the human eye.

CAVEAT: Wait until June 06 and you will miss it!

For North American observers, the transit begins on **Tuesday, June 5**, just after 6:00 p.m. EDT. By convention, popular solar tables are titled by the date of the mid-event in Universal Time; in this case, "greatest" time is after midnight in Greenwich on June 6. See <http://www.transitofvenus.org/june2012/where-to-be>.

Last of a Lifetime!

Transits occur only when Earth, Venus, and the sun align at the orbital nodes. It can happen twice in an 8-year span (e.g., 2004 & 2012), but then there is a gap of more than 100 years. The next transit won't happen until December 2117, but it will not be visible across most of the United States. The next transit of Venus visible around the Great Lakes is December 2125.

The Black Drop Effect

Observers have seen a ligament appear between Venus and the sun as Venus nears internal contact with the sun's edge. For example, James Cook witnessed the black drop effect from Tahiti.

You can simulate the conundrum by holding your thumb and finger against a bright background and pinching together. As they near contact, a black ligament appears between them.

Astronomers watching a transit of Mercury with the TRACE spacecraft, above earth's atmosphere, have determined the black drop effect is caused by limb darkening and instrumental point spread function.

Do Try This at Home (or School):

Teacher resources are at <http://www.transitofvenus.org/education/teacher-resources>.

Tip off your local marching band to John Philip Sousa's *Transit of Venus March* and ask them to perform it during the 2012 season. More ToV music is at <http://www.transitofvenus.org/education/music>.

Enlist your local arts community to host a Transit of Venus art exhibit. Involve everyone from adults to school kids.

Share tradition of St. Michael's Church, which every century honors in stained glass its parish member Jeremiah Horrocks, who first witnessed a transit of Venus in 1639. Print a stained glass window template onto transparencies. With markers, draw an image in the circle, personalize the banner with words, and color. Affix to real window.

Using phone app, record the time of internal contact and send your data to new global endeavor to measure the Astronomical Unit. Enjoy other phone app functions. See Transit of Venus Project at www.transitofvenus.nl.

Facebook, of course. Be active with new media, including the Transit of Venus Group (<http://www.facebook.com/groups/108400462513165/>) on Facebook and NASA's Sun-Earth Day Twitter site.

Spread the word! From your website, please link to www.transitofvenus.org.

Countdown to the Transit of Venus:

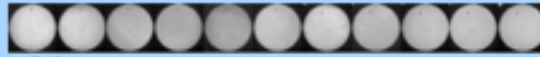
Days

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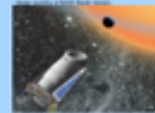
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Is the transit of Venus safe to watch?

You are looking at the sun, so take precautions to protect your eyes. Safe techniques include:

- wear screen projection
- wear ASP® Workshop XYZ®
- wear shades (yellow)
- hardening glass #14
- wear filters on telescopes
- hydrogen alpha telescopes

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Note: The use of filters is discussed elsewhere in this kit. This is a safe method of the foundation.



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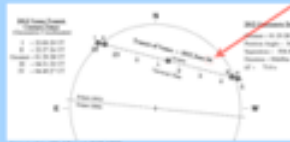
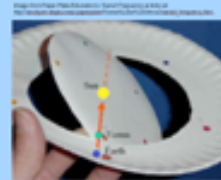


Image courtesy of NASA/JPL-Caltech



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Image courtesy of NASA/TRACE

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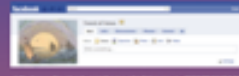
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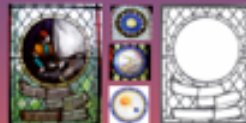
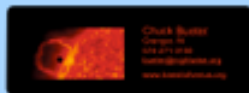
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