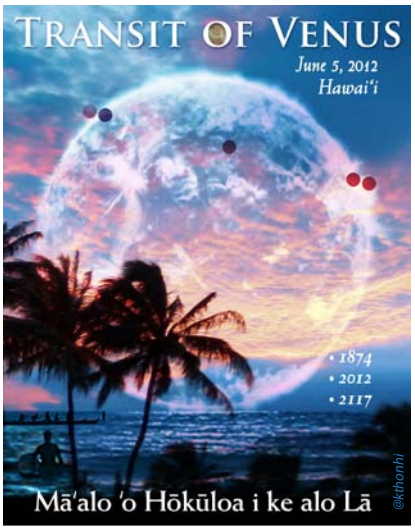
Special Public Event
June 5, 2012 — noon to 7:00 pm
www.ifa.hawaii.edu/transit

UNIVERSITY of HAWAI'I® MĀNOA
Institute for Astronomy



Join us on June 5th

The Institute for Astronomy will be providing protective solar viewers to the public and have telescopes with special solar filters to see the transit of Venus at the following locations:

Waikīkī
Kūhiō Beach–Kapahulu Ave.

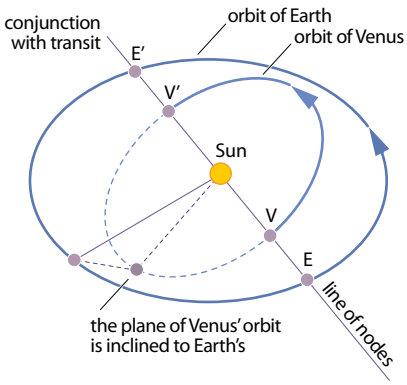
Ford Island
Pacific Aviation Museum

Ko Olina
near Lagoon 4

See schedule at ***www.ifa.hawaii.edu/transit***

Transits of Venus Are Rare Events

@kthonhi



Every 130 years, when Venus and Earth are in line with the sun, there are two transits of Venus separated by eight years.

Experience the Transit of Venus

June 5, 2012, 12:10 p.m. to 6:45 p.m. HST

On the afternoon and evening of June 5, people in Hawai'i will have the rare opportunity to view the planet Venus cross the disk of the sun. This is the last time this will happen in our lifetimes: The next transit of Venus will occur in 2117.

Sunset Spectacle. Nitzschke's illustration of a transit at sunset. Courtesy www.transitofvenus.org

How and Where to See This Event

Venus will appear as a small dark spot moving across the sun. The important thing to remember is **never look directly at the sun without proper eye protection**. Sunglasses do **not** provide enough protection. You can use a "solar viewer" to look at the sun safely, come to one of the locations (Waikīkī, Ford Island, Ko Olina) where the Institute for Astronomy will set up telescopes with special solar filters for public viewing, or watch the live NASA webcast from Mauna Kea (http://sunearthday.nasa.gov).

The Scientific Reason for Observing Transits of Venus

In the 18th and 19th centuries, scientists mounted international expeditions to observe transits of Venus as a way to determine the distance between Earth and the sun. Edmund Halley (1656 to 1742), the English scientist for whom the comet is named, figured out that if scientists observed a transit of Venus from many widely separated places on Earth, their data could be used to measure the parallax of the sun, and hence its geometric distance from Earth, with unprecedented precision. A parallax is a form of triangulation in which the apparent displacement of an object, as seen from two different points not on a straight line with the object, is measured.

'Āpua, O'ahu. Courtesy National Maritime Museum, London

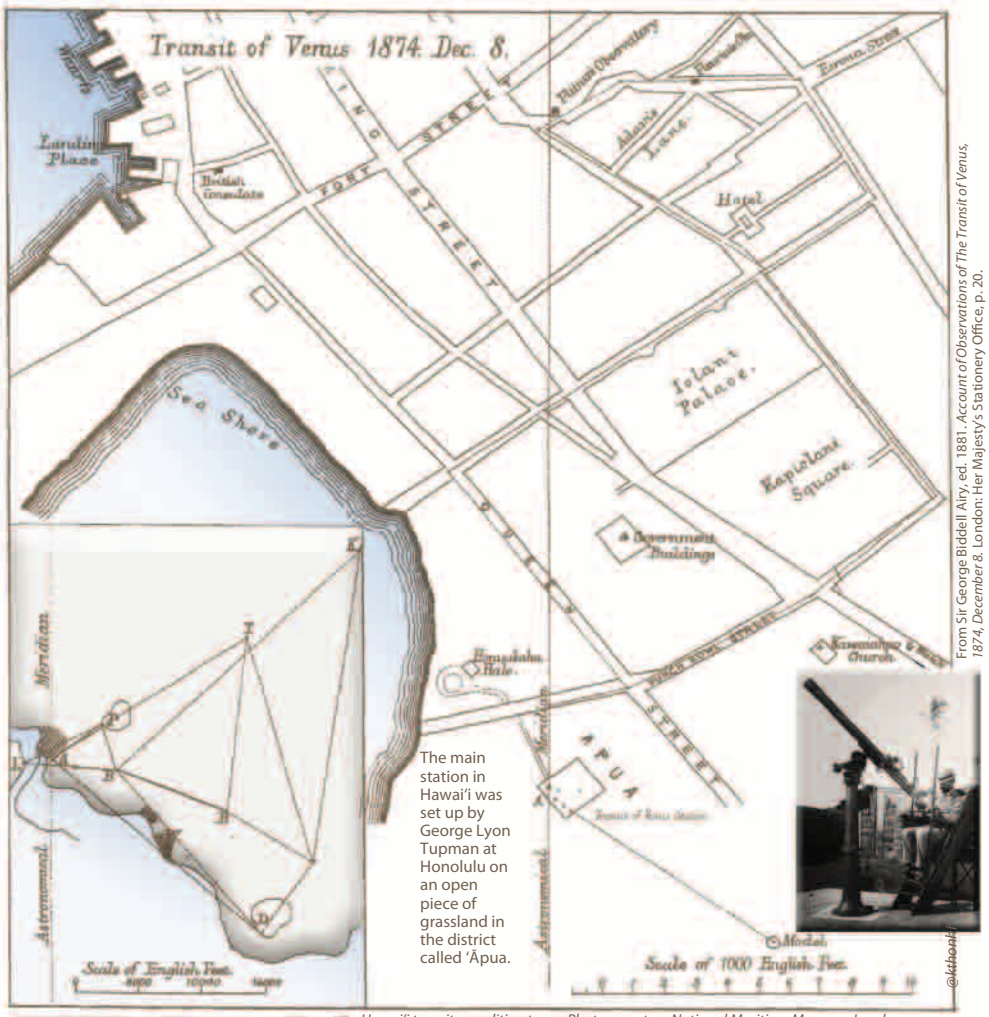
18th and 19th Century Transit Expeditions to Many Places, Including Hawai'i

As part of a European effort to observe the transit of Venus in 1769 from widely separated places on Earth, Captain James Cook of Britain (the same one who later came to Hawai'i) set sail from Plymouth, England, in 1768 to arrive in Tahiti in time to observe the transit in June 1769. Other European expeditions traveled to observe the transit at Hudson Bay in northern Canada, near the Caspian Sea in Russia, on the west coast of Mexico, in northern Norway, and in southeastern India. In 1771, the French astronomer Joseph Lalande used the data from the Venus transits in 1761 and 1769 to derive an Earth–sun distance of 153±1 million kilometers.

The next transit of Venus occurred in December 1874, and Hawai'i was one of the places it was visible. A British expedition arrived in the Kingdom of Hawai'i in September of that year to set up an observatory in Honolulu with auxiliary stations in Kailua-Kona and at Waimea on Kaua'i. They were warmly greeted by King David Kalākaua, who gave them use of land near Honolulu's waterfront in an area called 'Āpua, near what is now the corner of Queen and Punchbowl Streets.

Kalākaua was very interested in science and technology. His residence, 'Iolani Palace, had electricity and telephones before the White House. On an 1881 trip to the United States and beyond, Kalākaua visited Lick Observatory in San Jose, California, and expressed an interest in bringing a telescope to Hawai'i. Soon after, perhaps as a result of Kalākaua's interest, a five-inch refractor telescope was purchased from England for Punahou School. It was the first permanent telescope in Hawai'i.

Of course, the Hawai'i expedition was not the only one to observe the transit of Venus in 1874. The U.S. Naval Observatory mounted several to far-flung places in both 1874 and 1882. When American astronomer Simon Newcomb combined the 18th century data with those from the 1874/1882 Venus transits, he derived an Earth–sun distance of 149.59±0.31 million kilometers (about 93 million miles), very close to the results found with modern space technology in the 20th century, when there were no Venus transits. ■ L. Good & K. Teramura



From Sir George Biddell Airy, ed. 1881. *Account of Observations of The Transit of Venus, 1874, December 8.* London: Her Majesty's Stationery Office, p. 20.

Hawai'i transit expedition team. Photos courtesy National Maritime Museum, London

25 April 2012

Jeremiah Horrocks was only twenty one years old when he correctly predicted the 1639 transit of Venus.