

Challenger
LEARNING CENTER
of Hardin County



Jefferson

Community College

The Otter Creek Astronomical Observatory

The Observer

January 2006 (#3)

Public Programs at Otter Creek Observatory (through June 2006)

Evening Programs -- Join the observatory staff for a tour of what is visible in the night sky, including the moon, stars, and planets.

All evening programs are "weather permitting"--if the sky is not clear enough for celestial objects to be visible the observatory will not be open.

February 4, 2006
6:30 to 8:30 pm EST

March 11, 2006
7:30 to 9:30 pm EST

April 8, 2006
8:30 to 10:30 pm EDT

May 6, 2006
9:00 to 11:00 pm EDT

June 3, 2006
9:30 to 11:30 pm EDT

Daytime (solar) Programs -- Daytime programs are "open house" at the observatory. Come safely observe of the Sun, with its prominences and sunspots. Walk the model solar system trail and get a sense of the size of things in space. And learn about the observatory -- after all, you can't really see what's in the observatory when it is dark.

Daytime programs are held "rain or shine"--the observatory is open regardless of weather.

February 18, 2006
11:00 am – 1:00 pm EST

March 25, 2006
11:00 am – 1:00 pm EST

April 22, 2006
11:00 am – 1:00 pm EDT

May 20, 2006
11:00 am – 1:00 pm EDT

June 17, 2006
11:00 am – 1:00 pm EDT

Visit the Otter Creek Observatory web page at

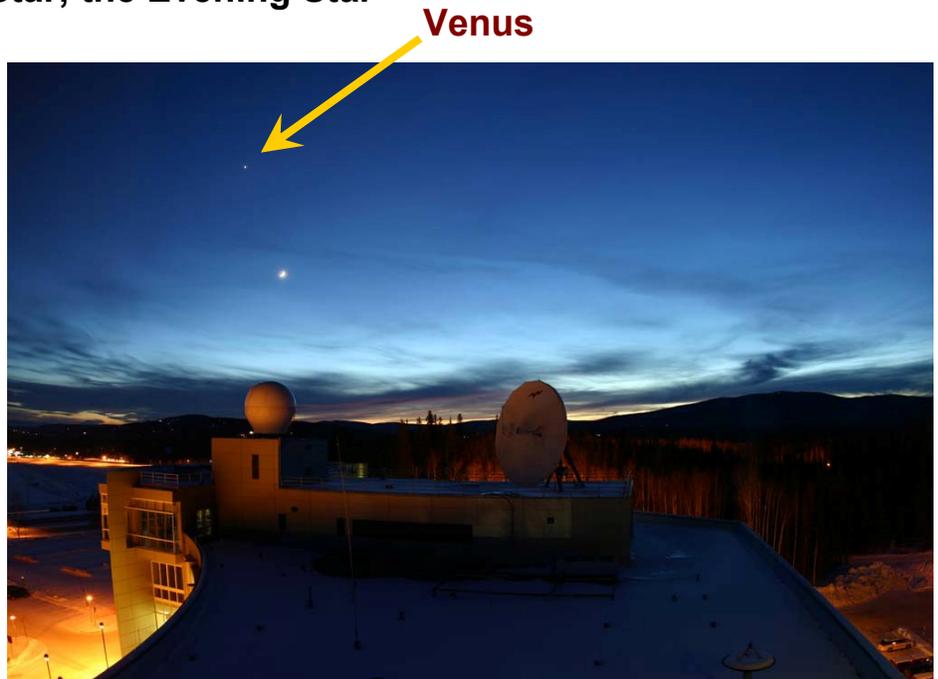
www.ottercreekpark.org

Venus: The Morning Star; the Evening Star

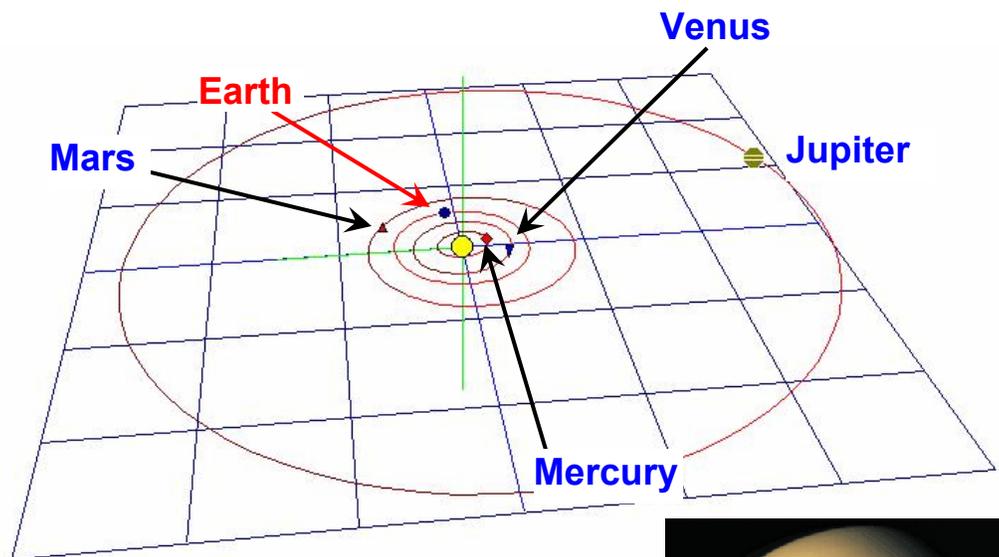
A common sight in the morning and evening sky is the planet Venus. Venus is an extraordinarily bright celestial object (3rd brightest after the Sun and Moon). It appears more than twenty times brighter than the brightest star (Sirius, the dog star, located in the constellation Canis Major “The Big Dog”). In really dark locations Venus reputedly can even cast faint but noticeable shadows! So why does Venus look bright? And why is Venus only seen in the morning or evening sky (you never see Venus during the “wee hours” of the night)?

Venus appears bright for several reasons. First, Venus is fairly close to Earth as planets go. As seen in the diagram, Venus’s orbit never takes it that far from Earth, especially in comparison to Jupiter and the planets that lie beyond Jupiter. Second, Venus appears bright in part because it is covered entirely with light-colored clouds that are brightly lit by the Sun. It has an *albedo* of 0.65, the highest of any planet in the Solar System. And since Venus is closer to the Sun than Earth, the sunlight that strikes those bright clouds is very intense. Lastly, Venus is large in comparison to the other not-too-distant planets, Mercury and Mars.

Albedo is a measure of reflectivity. Pure white snow would have an albedo of near 1.00. A lump of coal would have an albedo of near 0.00.

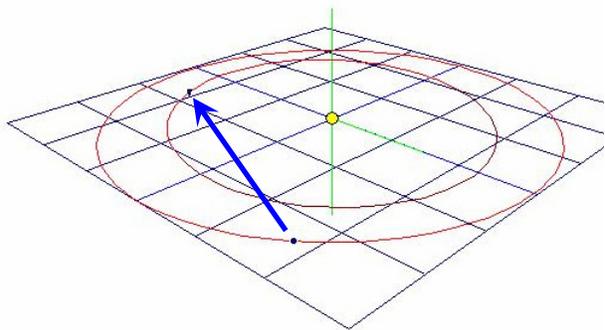


*Venus and the Moon after sunset.
(Poul Flyvholm Jensen)*

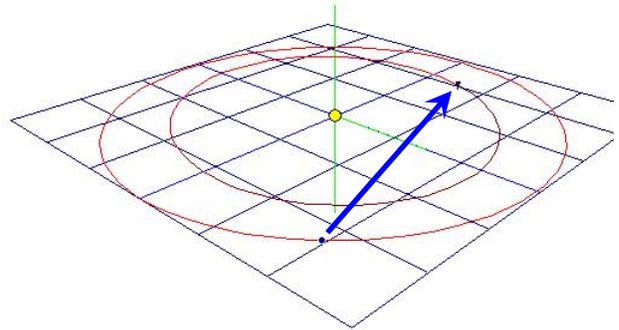


Cloud-covered Venus as seen by the Galileo space probe.

So Venus is brighter than nearby planets like Mercury or Mars because it is bigger than they are (Venus is 95% the size of Earth while Mercury is only 38% and Mars is 53%) and because it is lighter in color than they are (Mercury's albedo is 0.11; Mars's albedo is 0.15). Venus also appears brighter than giant planets like Jupiter and Saturn because it is much closer to Earth than they are, its albedo is greater than theirs, and it is much closer to the Sun (and thus is much more intensely illuminated) than they are.



Venus East of Sun



Venus West of Sun

Venus is only seen in the morning or evening sky because it is always close to the Sun. Venus orbits inside the Earth's orbit, so it always has to be close to the Sun in the sky. It can be either to the left (East) of the Sun, or to the right (West) of the Sun, or in front of or behind the Sun. When it is to the East it sets shortly after the Sun and is seen in the evening, and is the "Evening Star". When it is to the West it rises shortly before the Sun and is the "Morning Star". But it can never be on the other side of Earth, opposite the Sun, which is where it would have to be to be visible in the "wee hours" when the Sun is on the other side of the globe.

Planetary data cited in this poster courtesy of the Solar System Dynamics Group of the Jet Propulsion Laboratory (<http://ssd.jpl.nasa.gov/>).



The Moon and Venus as seen through a small telescope (Iowa State Polaris Project).