

A Night at the Telescope

28 May 2004

Here are some facts about some of the objects we will try to see tonight.

Comets NEAT and LINEAR

Two comets are visible now as they make their closest approach to the Sun. Comet NEAT is relatively high in the sky just after sunset but has already begun to fade. It should be easy to see in binoculars—if you know where to look! Comet LINEAR will be close to the horizon at dusk today but will be higher in the first week of June. It is still brightening. For up-to-date tips on how to find these comets and other special sky events, go to *Sky & Telescope's* web site, listed as #1 below.

Jupiter

The second brightest planet (after Venus, see below), it is in the summer constellation Leo tonight. In fact it will be the brightest night sky object other than the Moon, so it is easy to find with the naked eye. We will try to see some of Jupiter's own moons in the telescope. Jupiter is the largest planet in the Solar System, roughly 11 times larger in diameter and 318 times larger in mass than the Earth. But you could not stand on its surface—it is made mostly of gas. Jupiter orbits the Sun every 12 years.

The Moon

All planets except Mercury and Venus have moons (even Pluto). “The Moon” (with a capital M) is Earth's moon. It is about 81 times smaller than the Earth in mass and has about 3/11 the diameter, and it is about 400,000 kilometers away. Moon rocks are similar to the Earth's mantle (the part below the crust and above the core). Many scientists believe that the Moon formed in a gigantic collision between the Earth and a smaller planet (one that no longer exists) early in the history of the Solar System. It would have been much closer to the Earth then, but the Moon's orbit is expanding about 4 centimeters per year. That's pretty slow, but the Earth is 4.6 billion years old, so at constant speed it would have been half as far away when the Earth and Moon were young.

The moon will be slightly more than half full tonight.

Arcturus

Arcturus is one of the brightest stars in the northern sky. Find it by starting at the Big Dipper. Follow the arc made by the handle, and extend it in your imagination in the direction away from the bowl. The first bright star you come to will be Arcturus. It is slightly orange in color. It is a red giant, as our Sun will one day become, about 4 times more massive, 20 times larger, and 100 times brighter than the Sun. It is also zipping past us at 120 kilometers per *second*, or about 1/25 of a light-year per century. Despite its great distance (37 light years) this is enough to have changed its position on the sky perceptibly in historical times. In a few thousand years it will be twice as far away, and in half a million or so, it will be too faint for the naked eye!

Messier 13

With the Moon up, the sky may be too bright to see this. It is a globular cluster—a spherical cluster of more than one hundred thousand stars, 23 thousand light-years away. The stars in globular clusters are thought to be among the oldest in the Galaxy—in fact in the universe—perhaps 11 billion years old. This cluster got its name because it appears on 18th-century French comet hunter Messier got tired of mistaking other objects for new comets, so he made a list of objects that look like comets but are not. Messier 13 is on his list, as are many other star clusters, gas nebulae, and even nearby galaxies. See pictures of the whole list at web site #2.

The Transit of Venus

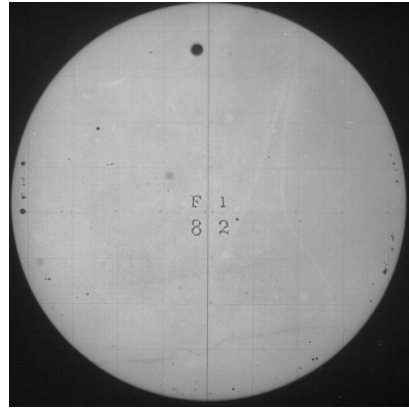
(This isn't something to see tonight, but it is a special event coming soon.) The reason it's hard to see Venus right now is that it appears very close to the Sun. In fact, on June 8 it will pass in front of the Sun! This is a very rare event—it last happened in 1882. Long before spacecraft and radar, 18th-century astronomers measured the size of the Solar System by observing a transit of Venus simultaneously from different parts of the Earth and applying simple geometry. (The principle is the same as depth perception, but with the diameter of the Earth replacing the distance between your eyes.) People in Europe will be able to see the whole transit, which lasts about 6 hours. In the Eastern United states, the transit will end between 7 and 7:30 AM. (It will take Venus this long to cross the edge of the Sun.) If you are up early, you can see it—but only with proper equipment. **DO NOT LOOK AT THE SUN WITH UNPROTECTED EYES. YOU WILL DAMAGE YOUR VISION. DO NOT USE REGULAR SUNGLASSES OR OTHER IMPROVISED FILTERS.** Buy an official sun filter. You can probably get one at Edmund Scientific, The Nature Company, and similar stores, or order online—see web site #1 for details. Venus should look like a small black dot on the edge of the Sun's disk, like a black bean in front of a basketball.

Interesting Web Sites

- #1 <http://skyandtelescope.com> Great online mag for amateurs
- #2 www.seasky.org/sky1c.html Complete Messier catalog
- #3 antwrp.gsfc.nasa.gov/apod/ Astronomy Picture of the Day



Comet NEAT. Credit: Chris Schur, 05/08/2004.



Transit of Venus in 1882. Credit: US Naval Observatory.



Messier 13. Credit: Jason Ware.